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# ROYAL COMMISSION ON ENERGY

## SECOND REPORT







# ROYAL COMMISSION

ON

## ENERGY

To His Excellency the Governor General in Council,

AND TO PARLIAMENT ASSEMBLED,

we, Commissioners appointed by Order in Council dated 19th October, 1957 and 19th January, 1958, to inquire into and report upon the Commission's work and the matters referred to the Commission by the Order in Council dated 19th October, 1957.

## SECOND REPORT

AND TO PARLIAMENT ASSEMBLED,

AND TO PARLIAMENT ASSEMBLED,

JULY 1959





S E C O N D     R E P O R T

To His Excellency the Governor General in Council,

MAY IT PLEASE YOUR EXCELLENCY,

We, Commissioners appointed by Orders in Council dated 15th October, 1957 and 13th January, 1958, to enquire into and make recommendations concerning the matters more specifically set forth in the Order in Council dated 15th October, 1957:

BEG TO SUBMIT TO YOUR EXCELLENCY THE FOLLOWING

SECOND REPORT.





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## FOREWORD

This Second Report deals with the policies which the Commission believes will best serve the national interest in relation to the export of crude oil and the marketing of crude oil within Canada itself. The First Report of the Commission dealt with most of the specific matters mentioned in the Order in Council under which it was established (see Appendix A), with certain important exceptions. These exceptions related to the section in the Order in Council which requires the Commission to enquire into and make recommendations concerning "the policies which will best serve the national interest in relation to the export of energy and sources of energy from Canada". The First Report dealt with this section of the Order in Council only in terms of natural gas. This report deals with export problems and policies concerning crude oil.

The extension of the field of enquiry in this report to include an appraisal of some of the problems relating to domestic as well as to export markets was necessary because the export and domestic markets for Canadian crude oil are inter-related. A review of export markets alone would not therefore have been sufficient. The significance of the domestic market to Canada is illustrated by the fact that petroleum is the source of 54 per cent of all the energy used in Canada at the present time. Strong representations were made to the Commission during its public hearings in 1958 concerning the possibility of Canadian crude oil being used by the Montreal refineries in substitution, in whole or in part, for overseas crudes. In view of the importance of this matter to Canada and to its oil industry and because of its close connection with the problem of export markets, this report has attempted to explore the possibility and the implications of the Montreal market proposal and to make recommendations accordingly.

The Commission recognizes that the problems arising out of the marketing of crude oil inevitably raise other issues concerning conservation, exploration, production, transportation, refining and retail marketing and taxation, but it did not consider that it was required to investigate and report upon all aspects of the oil industry. We have thought it pertinent to our terms of reference, however, to review in some detail the situation concerning the reserves of crude oil in Canada and to appraise the recent course and future prospects of export and domestic markets. In Appendix E we have assembled an historical series of Canadian petroleum statistics.

The task of the Commission has been made especially difficult by reason of the fact that the North American and international oil markets are passing through a period of rapid and perhaps fundamental change. This condition had not become obvious in the early part of 1958 but since the Commission finished its public hearings in the fall of that year the world oil economy has been marked by the appearance of surpluses of crude oil and products, by more intense international competition for markets and by declining prices. The policy of the United States in restricting imports of petroleum was intensified during this period but has taken a new and a more encouraging turn, insofar as Canada is concerned, by the exemption from such restrictions of Canadian crude oil transported by pipe line. These changes in international and United States market conditions are already being felt by the Canadian oil industry. However, the full implications for Canada of the changing international situation concerning petroleum may not be apparent for some time to come. The fact that these changes are so recent and that they are still continuing to take place, made it difficult for the

Commission to determine how far certain problems facing the oil industry could be regarded as temporary.

The Commission was fortunate in the co-operation which was extended to it by Provincial Governments, oil and pipe line companies, the Oil and Gas Conservation Board of Alberta, the Canadian Petroleum Association, Canadian Bechtel Limited, Mr. W.J. Levy and many other individuals and groups. We received valuable written and oral submissions and supplementary information from these sources. The Commission wishes to thank all those concerned for their submissions and for the other forms of assistance which they so generously gave to the Commission.

We wish to make special mention of the services rendered by all members of the Commission staff, by our Counsel, Advisers, Secretary and Research Assistants. Mr. Arthur S. Pattillo, Q.C., of Toronto and Mr. M.H. Patterson of Calgary, as Counsel and Assistant Counsel respectively rendered outstanding service to the Commission. Dr. R.L. Hearn as consulting engineer, Mr. R. Bruce West as financial consultant, both of Toronto, and Mr. J.C. Sproule and his associates of Calgary as technical advisers, all gave unstintingly of their time, experience and abilities to the work of the Commission. We are greatly indebted to the Department of Finance for the loan of Mr. J.F. Parkinson, our Secretary, and Mr. M.F. Bélanger. Major N.A. Lafrance came to us through the kindness of the Department of National Defence as Assistant Secretary and was of great assistance in our travels across Canada and in the administration of the Commission. We are grateful to the Department of Mines and Technical Surveys for the services of Mr. Ralph B. Toombs, without whose knowledge of the oil and gas industries the task of the Commission would have been even more difficult than it was. We are also grateful to the Department of Trade and Commerce



for the loan of Mr. G.W. Green for a substantial period. To all of these men and to all members of the staff of the Commission we express our thanks and gratitude for their loyalty as well as their willingness at all times to give themselves unsparingly to the work of the Commission.

## CHAPTER 1

### CRUDE OIL RESERVES

#### General Prospects

Although there are a number of areas throughout Canada which are geologically favourable to the occurrence of oil, the Western Canada Sedimentary Basin is by far the most important one. It is the source of oil and gas production in the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba and in the Northwest Territories. Some areas outside the Western Canada Sedimentary Basin have produced oil for local use for many decades; others have not yet been drilled or have failed so far to yield oil in commercial quantities.

From the standpoint of oil and gas possibilities the most important of the Eastern Canada sedimentary basins comprises that part of southern Ontario which lies to the southwest of the boundary of the Canadian Shield, from the northern part of Manitoulin Island easterly to the vicinity of Kingston. This sedimentary basin represents a northern extension of the Ohio and Michigan basins of the United States. The Ontario portion covers an area of at least 25,000 square miles. Although oil has been produced in southwestern Ontario since the early 1860's, gas production is now of more importance, particularly in view of the recent successful drilling in Lake Erie.

The St. Lawrence Lowlands basin of Eastern Canada has some geological characteristics in Palaeozoic strata favourable to the accumulation of oil and gas in limited amounts but no commercial deposits of either oil or gas have been found to date. This basin may

be described, generally, as having a west-east axis that is occupied by the valley of the St. Lawrence and the upper portion of the Gulf of St. Lawrence.

Another sedimentary area in Ontario borders James Bay on the south and west and extends along Hudson Bay to the Churchill River in Manitoba. This plain, the Hudson Bay Lowland, is underlain by strata, chiefly of Palaeozoic age, and covers an area of about 125,000 square miles. The sediments are relatively thin and as yet there is insufficient evidence to suggest that this region will yield oil or gas in commercial quantities.

Sedimentary basins also occur in the Appalachian region, another of the principal physiographic and geological regions of Canada, which comprises Nova Scotia, New Brunswick, Prince Edward Island, the Island of Newfoundland and that part of Quebec lying generally to the east of Quebec City and south of the St. Lawrence River. This region is underlain chiefly by Palaeozoic rocks. Marine sediments favourable to oil occurrences are known to exist in areas bordering the Gulf of St. Lawrence extending from the Gaspé peninsula to Newfoundland. While numerous oil seepages have been noted over the past century in the eastern part of the Gaspé peninsula, intermittent drilling since the 1880's has failed to establish any commercial accumulations of oil in the area. However, some authorities consider that the Gaspé peninsula has favourable geological indications and that oil may eventually be found.

The only production in the Maritimes comes from the small Stony Creek field discovered in 1909 near Moncton. In this area a certain amount of exploratory work has been carried out over a period of years with indifferent success. Drilling operations carried on elsewhere in the Maritimes include one well drilled to a depth of



14,696 feet near Hillsborough Bay, Prince Edward Island, in 1945.

These and subsequent efforts to locate oil have been unsuccessful but the search continues in the Atlantic region, including Newfoundland.

The mountainous belt known as the Cordilleran Region, which borders the Pacific Ocean and extends 500 miles eastward to the Interior Plains, contains along its eastern flank, within the Canadian Rocky Mountains, extensive territory favourable for oil and gas exploration. There are a number of sedimentary localities throughout the Cordilleran Region in which some oil and gas exploratory work has been done but as yet there have been no positive indications of oil in commercial quantities, except, of course, in the eastern zone of the Rocky Mountains, which can be considered as part of the Western Canada Sedimentary Basin.

Authorities agree that there are no oil and gas possibilities in the great region of Precambrian rocks known as the Canadian Shield.

#### Western Canada Sedimentary Basin

Lying between the Cordilleran Region and the Canadian Shield are the Interior Plains, a northward extension of the Interior Plains of the United States. These Plains begin at the Gulf of Mexico and extend northwestward through Canada to the Arctic Ocean. For the purposes of this analysis we are describing the Interior Plains in Canada and the transitional zone on the west which passes into the Cordilleran Region as the "Western Canada Sedimentary Basin". Chart 1 shows the location and extent of the Western Canada Sedimentary Basin.

CHART 1



## Geology

The continental section of the Western Canada Sedimentary Basin extends from the International Boundary 1,500 miles northward to the Arctic Ocean over large areas of the Prairie Provinces and northeastern British Columbia, the Yukon and Northwest Territories. At the International Boundary the Basin has a width of 800 miles; near the Arctic Coast it narrows to 300 miles. Geologically, it is the northern portion of the great interior continental basin. It is bounded on the east by the Precambrian Shield and on the west by the Cordilleran Region. The Arctic Ocean forms the northern boundary of the continental portion of the Basin, although the sedimentary basin proper would include the Arctic Islands west and north of the Canadian Shield. The continental portion of the Basin encompasses an area of approximately 750,000 square miles of potential oil and gas producing territory. If the Arctic Islands\* are included in this territory, the total area of the Basin would be increased by possibly 230,000 square miles. The Continental Shelf underlying the Arctic Ocean itself may offer possibilities of oil occurrences. Thus, the area of the Basin may prove to be even more extensive.

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\* The Arctic Islands, or the Arctic Archipelago, lie north of the Canadian mainland. The land area of this region exceeds half a million square miles, almost one-seventh of the land area of Canada. Geologically, the Islands are the northward extension of the North American Continent and thus consist, in part, of an extension of the Canadian Shield and, in part, of flat-lying sedimentary strata of Palaeozoic Age which form the Arctic Lowlands and Plateaux and which constitute an extension of the Interior Plains. To the north and west of these strata there are belts of variously folded sedimentary rocks, which make up the Innuitian Region, and on the extreme west the Arctic Islands are bounded by a coastal plain. The Western Canada Sedimentary Basin thus in effect extends north of the Arctic Coast to take in a large portion of the Arctic Islands, outside of the Canadian Shield. It is of interest to note that since the end of 1958 many applications have been made to the Federal Government for exploratory rights covering millions of acres in the Arctic Islands.



Diverse geologic conditions have existed in the past with the result that within the Basin there are a number of smaller basins owing their origin to arch-like features extending westward and southward from the Canadian Shield. From south to north these smaller depositional and structural units include the Williston basin, the Alberta basin, a basin in the vicinity of the Peace and Liard rivers and the Mackenzie delta basin. The intervening zones also contain sediments but most discoveries to date have been made in and along the margins of the several basin areas. Great importance is attached by the industry in its search for oil and gas to the structural and stratigraphic features associated with these basins. Within and to the west of the Rocky Mountains there are other basins which have not as yet been completely delineated.

The Williston basin occupies a large part of southern Saskatchewan and, although centred in the United States, has sediments in excess of 12,000 feet in thickness in the Canadian portion. The Alberta and the Peace-Liard basins, separated by the Peace River Arch, contain sedimentary sequences of more than 15,000 feet in thickness. Throughout these and the other basins, formations of practically every geologic age are represented and many of these have already been found productive of oil and gas. It has become apparent from exploration that the structural features throughout the Western Canada Sedimentary Basin have created many favourable conditions for the accumulation of oil and gas.

Structural and stratigraphic evidence, based on geological mapping, geophysical surveys and the examination of cores from hundreds of wells, indicates the possibility of large additions to present estimates of proved reserves. The continental portion of the Basin, with its area

of some 750,000 square miles and thicknesses ranging from 1,000 to 2,000 feet near the Precambrian outcrop on the east to about 15,000 feet along the western edge of the Interior Plains and even greater thicknesses in the Foothills and adjacent Rocky Mountains, contains almost one million cubic miles of sediments. The dimensions of the Western Canada Sedimentary Basin thus suggest that the volume of ultimate oil reserves will be substantial.

In the search for oil only about one-half of the continental section of the Basin has been subjected to preliminary exploration, including some drilling. Exploration has been concentrated in and around basins in the more populated and easily accessible parts of the Prairie region. Seismic and other geophysical methods have been extensively used but little more than one-tenth of the entire region has been investigated by drilling. Even within these relatively restricted areas of intense exploration, comparatively few wells have been drilled to maximum depths of the Basin. In fact, of the total of 22,500 wells drilled in Western Canada to the end of 1958, not more than 400 have been drilled to the underlying Precambrian basement rocks. Consequently, large portions of the Basin remain to be thoroughly tested before its ultimate reserve potential can be accurately established. The south-central portion of Alberta, east of the Foothills, has so far attracted the most attention and contains over half of the producing wells in Canada. Recently, exploratory work has been extended into more northerly regions and important discoveries have been made in the area mid-way between Edmonton and the Peace River region and in north-eastern British Columbia. The main activity in Saskatchewan has been from Lloydminster south to the International Boundary along the Alberta border and in the southeast corner of the Province. Exploration and development in Manitoba have been limited to the southwest corner of the Province.

Activity in British Columbia has been concentrated in the Peace River District. In the Northwest Territories it has been centred in the Mackenzie River Valley.

### Reserves

Drilling and operating experience in the Western Canada Sedimentary Basin has proceeded far enough to provide the basis for what we believe to be reasonably sound estimates of the oil resources of the continental section of the Basin. In the estimates shown in Table I the term "oil" includes all economically recoverable liquid hydrocarbons, i.e., crude oil and natural gas liquids. Consequently, such estimates do not include the Athabasca oil sands, because they have not yet been proven to be economically recoverable. However, it should not be overlooked that very substantial sums are being invested at the present time in the experimental development of these oil sands and real efforts are being made to find ways and means of making them economically recoverable. It may well be that, in the reasonably near future, these oil sands will have a far greater significance than can be attributed to them at the present time.

The estimates of proved and probable reserves appearing in Table I are made on the basis of detailed drilling and operating experience. It was the consensus of those giving testimony on the subject to the Commission that these reserves form only a small part of the oil which will be recovered eventually from this section of the Basin.

TABLE I  
ESTIMATED CRUDE OIL AND NATURAL GAS LIQUID RESERVES

December, 1957

(in thousands of barrels)

Authority	Proved reserves (a)	Probable reserves (b)
<u>Alberta</u>		
Alberta Oil and Gas Conservation Board	3,366,000 <sup>(c)</sup>	
Canadian Petroleum Association	2,721,587	816,771
<u>Saskatchewan</u>		
Government of Saskatchewan	675,000 <sup>(d)</sup>	916,000 <sup>(d)</sup>
Canadian Petroleum Association	420,954	172,074
<u>Manitoba</u>		
Government of Manitoba	34,258	5,065
Canadian Petroleum Association	34,258	5,065
<u>British Columbia</u>		
Government of British Columbia	21,266 <sup>(d)</sup>	
Canadian Petroleum Association	25,602	44,153
<u>Northwest Territories</u>		
Canadian Petroleum Association	52,858	58,500
<u>TOTAL WESTERN CANADA SEDIMENTARY BASIN</u>		
Canadian Petroleum Association	3,255,259	1,096,563
The British American Oil Company Limited	.....4,295,000.....	

- (a) Proved reserves consist of remaining reserves of oil estimated to be recoverable under existing economic and operating conditions including both drilled and undrilled reserves, as defined by the Committee on Petroleum Reserves of the American Petroleum Institute.
- (b) Probable reserves consist of remaining reserves of oil estimated to be recoverable taking into consideration advances in operating techniques and extensions of proved areas based on reliable geological and engineering data.
- (c) The reserve computation method of the Oil and Gas Conservation Board of Alberta provides for the inclusion of some probable reserves; hence the estimate is in general agreement with the Canadian Petroleum Association estimate of proved and probable reserves.
- (d) Crude oil only. In conformity with the specifications of the American Petroleum Institute's Committee on Petroleum Reserves, crude oil estimates include all condensate which comes out of the separator with the crude oil and is run as part of the crude oil stream. All other condensate is included in the estimates of natural gas liquids. Regarding the differences in the two estimates of the proved and probable reserves for Saskatchewan, the Canadian Petroleum Association noted that some of the discoveries in Saskatchewan are relatively new and very limited production experience on certain pools is available. The Association stated to the Commission that: "Both the Department of Mineral Resources and the Canadian Petroleum Association are satisfied that they have made the best estimates possible from the data available to them and while both understand the reasons for the differences, neither would feel justified in changing its estimates at the present time."

Source: Submissions to the Commission.



The ultimate oil recovery from any basin must be conjectural due to uncertainties as to geological factors, technological developments, future costs and economic prospects in general. Estimates of the ultimate "possible" reserves in the continental section of the Western Canada Sedimentary Basin appear in Table II. It should be realized that the methods used in arriving at the estimates in Table II are subject to comparatively wide margins of error, both with respect to an estimate of volume of sediments and to the selection of appropriate accumulation factors.

TABLE II

POSSIBLE RECOVERABLE RESERVES OF CRUDE OIL AND NATURAL GAS LIQUIDS  
IN THE WESTERN CANADA SEDIMENTARY BASIN\*

Authority	Volume of sediments in cubic miles	Accumulation factor in barrels	Total possible reserves (thousands of barrels)
Canadian Petroleum Association	956,738	50,000	50,000,000
Shell Oil Company of Canada Limited	1,060,000	47,000	50,000,000
The British American Oil Company Limited	789,166	69,380	54,700,000

\* Excluding the Arctic Islands.

Source: Submissions to the Commission.

Available information does not permit an accurate estimate of the distribution by provinces or regions of the possible reserves in the Basin. However, in view of the fact that Alberta is estimated to have about two-fifths of the volume of sediments in the continental section of the Basin, it may reasonably be assumed that this province will be the most important source of oil in Canada for many years.

In estimating possible reserves in Table II a "volumetric method" has been used. Under this method an estimate is made, based on available geological data, of the volume of sedimentary rocks likely to contain crude oil and natural gas liquids. This volume, expressed in cubic miles, is multiplied by an "accumulation factor" which is an estimate of the number of barrels of recoverable oil thought to exist per cubic mile. The accumulation factors used are derived from the experience obtained from similar basins in an advanced stage of development.

A pioneer in this method of estimating possible reserves, L.G. Weeks, arrived at an accumulation factor of 50,000 barrels of liquid hydrocarbons per cubic mile, based on studies of producing basins in the United States. The similarity in geological characteristics of the Western Canada Sedimentary Basin and the large producing basins in the United States, together with a comparison of the exploratory records in both countries, suggest that Weeks' accumulation factor may be applicable in Canada.

The Canadian Petroleum Association, in its analysis, used the accumulation factor determined by Weeks. The British American Oil Company Limited used an accumulation factor of 69,380 barrels per cubic mile. This factor was arrived at from a study of the records of oil discoveries in the Mid-Continent producing fields in the United States. The company's estimate of 54.7 billion barrels for the possible reserves in the Western Canada Sedimentary Basin is made up of an estimated 48.4 billion barrels of crude oil and 6.3 billion barrels of natural gas liquids.

Shell Oil Company of Canada Limited, in its analysis, used an accumulation factor of 47,000 barrels per cubic mile. This factor was arrived at by dividing proved recoverable reserves in the United States,

as published in 1957 by the American Petroleum Institute, plus cumulative production to that year, by the estimated total volume of sediments in the United States, namely, two million cubic miles.

Shell Oil Company also made a study of the total oil generating capacity of the Western Canada Sedimentary Basin. The conclusion reached was that the volume of oil originally generated in the Western Canada Sedimentary Basin was of the order of 4,600 billion barrels. This estimate, of course, cannot be compared with the estimates of possible reserves given in Table II. These latter estimates measure the present and future availability of the oil which was originally generated. The results of the two analyses made by Shell Oil Company suggest that the estimates in Table II may be on the conservative side.

None of these estimates of possible reserves includes reserves in the Athabasca oil sands in Alberta. The estimates of these reserves have ranged from 100 to 300 billion barrels of heavy crude oil.

It will be seen from Table I that the Province of Alberta contains the largest proportion of the established reserves of the Western Canada Sedimentary Basin. This, in part, arises from the fact that exploration and development in that province have been in progress for a longer period. Because of the relatively short history of exploration throughout the Basin, Table I tends to understate the potential oil production outside of Alberta, particularly in British Columbia and the Northwest Territories.

The proved reserves of oil in the Basin have grown within the period of a decade to over three billion barrels by 1957, after allowing for the production of 835 million barrels. Since 1952 the average annual increase in gross reserves of crude oil and natural gas liquids in the Basin has been 435 million barrels.

Clearly, Canada's oil resources in the Western Canada Sedimentary Basin are very substantial although, as indicated in Table III, present proved reserves are small in relation to total proved world reserves, representing less than two per cent of the world total. However this proportion would be increased dramatically if Canada's potential oil resources in the Athabasca oil sands proved to be economically recoverable.

TABLE III

WORLD OIL RESERVES AS AT END 1957

(in millions of barrels)

WESTERN HEMISPHERE		EASTERN HEMISPHERE	
	1957		1957
U.S.A.		MIDDLE EAST	
Crude oil	30,300	Iran	32,000
Natural gas liquids	<u>5,688</u>	Iraq	25,000
Total	35,988	Kuwait	60,000
		Neutral Zone	5,000
CARIBBEAN		Qatar	1,750
Venezuela	16,000	Saudi Arabia	45,000
Colombia	650	Southern Arabia	500
Trinidad	<u>300</u>	Other Middle East	<u>251</u>
Total	<u>16,950</u>	Total	<u>169,501</u>
CANADA		AFRICA	814
Crude Oil	2,874	WESTERN EUROPE	1,369
Natural gas liquids	<u>395</u>	EAST INDIES	8,085
Total	<u>3,269</u>	OTHER FAR EAST	493
		U.S.S.R. and associated countries	24,500
MEXICO	2,750	EASTERN EUROPE	900
ARGENTINA	750	CHINA	800
PERU	275		
OTHERS	280		
TOTAL WESTERN HEMISPHERE	60,262	TOTAL EASTERN HEMISPHERE	206,462
TOTAL WORLD 1957 - 266,724			

Source: Compiled by BP Canada Limited from published sources.



The present proved reserves of oil in the Basin are sufficient to provide for 18 years of operation at the 1957 level of production or 12 years on the basis of the 1957 Canadian consumption of petroleum products. These estimates greatly understate the country's oil reserve position however, inasmuch as proved reserves represent only a small fraction of the possible reserves which it is reasonable to expect may eventually be recovered.

On the basis of quality, the proved oil reserves of the Basin have so far consisted largely of high gravity crudes and it is expected that future discoveries will follow the pattern of the past. In that event, the crude oils discovered in the Basin will be predominantly light crudes with a gravity range between 30° and 40° A.P.I.\* Some 90 per cent of the proved reserves of the Basin are in this range. Medium gravity crudes comprise some seven per cent of proved reserves. These crudes, ranging in gravity from about 20° to 29° A.P.I., have occurred in the shallower parts of the Basin located principally in western Saskatchewan. The remaining three per cent of the proved reserves of the Basin have been the heavy crudes of 8° to 19° A.P.I., occurring between Kindersley and Lloydminster in western Saskatchewan, and in eastern Alberta, to the north of the medium crude occurrences.

The high A.P.I. gravity of western Canadian crudes facilitates transportation over long distances by pipe line. If heavy crudes are to be moved economically by pipe line they require some processing, or mixing with lighter crudes, to reduce their viscosity. Furthermore, under normal refinery practice in North America, lighter gravity crudes

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\* The A.P.I. gravity is an arbitrary scale adopted by the American Petroleum Institute for expressing the specific gravity of oils. The lighter the oil, the higher is its A.P.I. gravity. Relation to specific gravity is as follows:

$$^{\circ} \text{ A.P.I.} = \frac{141.5}{\text{Specific Gravity at } 60^{\circ} \text{ F}} - 131.5$$

have a higher yield of gasoline and of light fuel oil than heavier crudes. As a result, where the balance of the demand for heavier fuels can be met from other sources, well-head prices for the lighter crudes reflect these premium uses. Technological advance in refinery practice and changing market requirements may, of course, reduce the price differential between light and heavier crudes.

The magnitude and quality of the resource base of the oil industry in Canada would not appear to give rise to special problems. The oils are predominantly of good grade and the reserves are clearly sufficient to support a large and expanding industry.



## CHAPTER 2

### PRODUCTION AND MARKETING OF CANADIAN OIL

The oil producing industry in Canada has grown rapidly since the discovery of the Leduc field in Alberta in 1947. In 1946 Canada produced 7,586,000 barrels of crude oil. In 1957 the output reached approximately 181,848,000 barrels. Drilling operations in Western Canada increased from less than 150 wells drilled in 1946 to a peak of some 3,300 wells in 1956. During the period the industry invested over three billion dollars in exploration, development and production of oil and gas in Western Canada. Between 1947 and 1957 the revenues of the Governments of Alberta, Saskatchewan and Manitoba were augmented by sales of mineral rights, rentals and production royalties by some \$781 million.\* The quick succession of oil discoveries in Western Canada, subsequent to the Leduc discovery, and the rapid expansion of production changed the whole Canadian oil supply picture. Indigenous production supplied less than 10 per cent of Canada's requirements of petroleum products in 1947 as compared with 47 per cent in 1957. The real proportions of this increase are apparent from the fact that the demand for all oils, domestic and imported, which amounted to 267,000 barrels per day in 1947 rose to 742,000 barrels per day in 1957. In 1947 there were no exports of crude oil from Canada. In 1957 exports were at the average rate of 152,000 barrels per day, with an approximate annual

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\* Of the total revenue of \$781 million, the Government of Alberta received \$724 million, the Government of Saskatchewan \$54 million and the Government of Manitoba \$3 million.

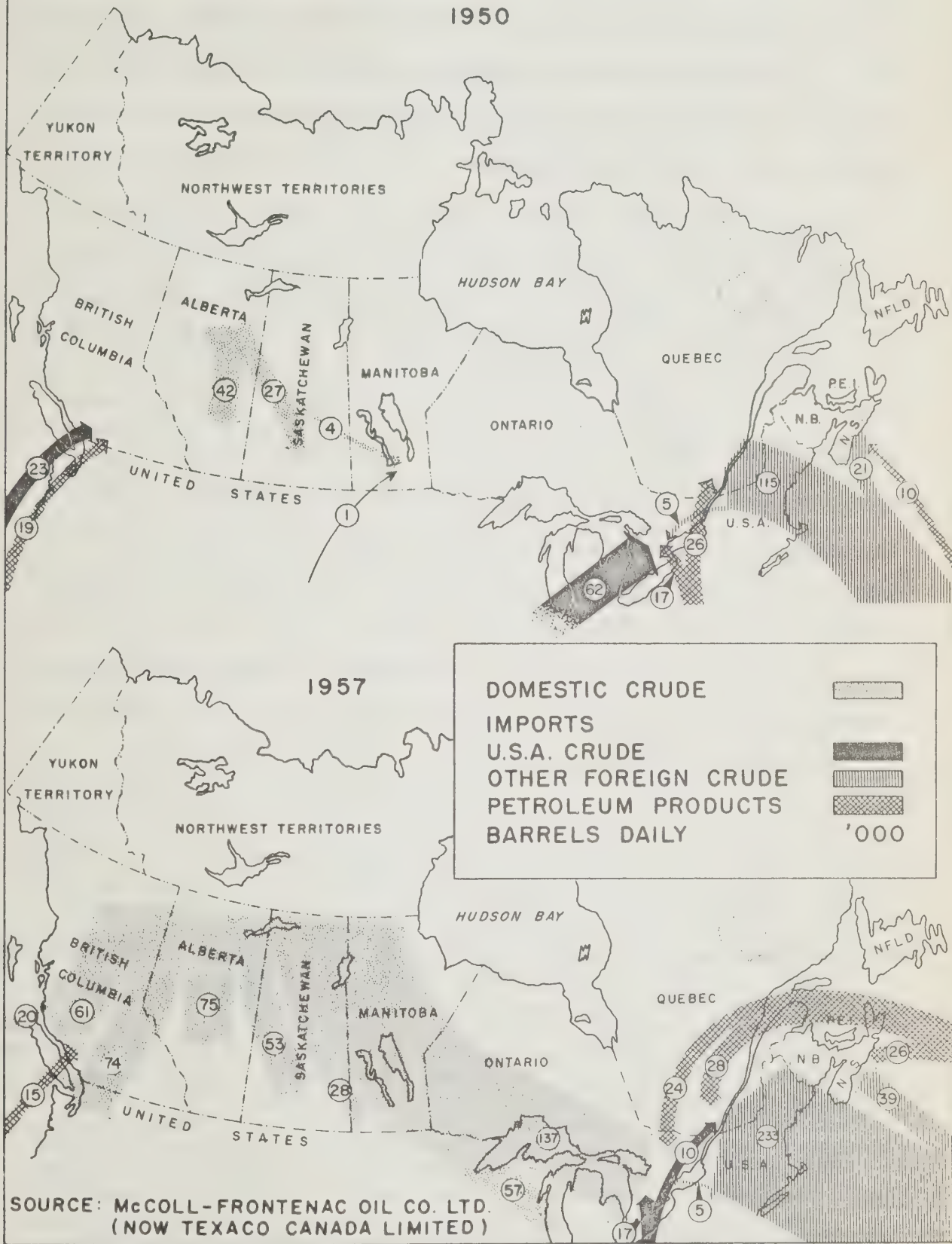


value of \$141 million and accounted for some 30 per cent of total production. In the peak month of the year the proportion was approximately 40 per cent. Taking into account exports of crude from Canada and imports and exports of refined products, Canada was, on balance, 67 per cent self-sufficient in petroleum by 1957. This large volume of exports reflected, of course, the greater demands occasioned by the Suez crisis of that year. By 1957 productive capacity in Canadian oil fields had reached a point where it could have supplied more than the total Canadian demand.

The dramatic nature of the change in petroleum production and supply which has occurred in Canada in recent years is illustrated by Chart 2, "Supply of Crude Oil and Petroleum Products in Canada 1950 and 1957".

Expansion in production and development of new resources and markets continued without interruption until 1957 as Canadian oil was successively delivered to more distant markets. After 1957, as discussed later, a number of events combined to interrupt the rapid expansion which had occurred during the preceding decade.

# SUPPLY OF CRUDE OIL AND PETROLEUM PRODUCTS IN CANADA 1950 AND 1957



## Stages of Expansion

### Eastward Expansion from Alberta

The initial expansion of production after the Leduc discovery led to a progressive capture of practically the entire prairie regional market for petroleum products, except specialty products. Before this discovery the Prairie Provinces largely relied on the importation of crudes and products from the United States and for this reason had long been a high cost area for such commodities because of remoteness from foreign sources of supply. Within a brief period existing refineries were converted to the use of Canadian crude. At the same time, in order to meet the growing demand for petroleum products, the refinery capacity of the region was expanded, first in Alberta and then in Saskatchewan. As a result the demand for petroleum products was met increasingly from domestic production. Initially the crude oil was delivered to the refineries by rail and road rather than by pipe line.

By 1949 reserves had been established in Alberta capable of producing, under accepted conservation principles, at rates in excess of the total demand of the Prairie Provinces. In 1950, at the request of the industry and following public hearings as to the most desirable procedures, a plan of prorating production to market demand was introduced in Alberta to meet the problem of surplus supply. Under this plan the Petroleum and Natural Gas Conservation Board of Alberta (now the Oil and Gas Conservation Board) receives from refining companies statements of their crude oil requirements for the succeeding months. On the basis of these "nominations" and other evidence, the total production permitted by the Province is allocated among the different pools or wells in the Province. The first basis of allocation is one designed to provide an "economic allowance" or a floor for each producing well. The second provides for a sharing of the residual demand, after provision for the "economic allowance",

in proportion to the maximum permissive rate of production of the different pools or wells as determined by the Board. The plan established by the Board in 1950 is still in use with only minor modifications. More fundamental changes are due to come into operation on January 1, 1960, the effect of which will tend to secure a larger output from the more productive wells or pools in the Province. Similar control of production is not as yet practised in the other Canadian producing provinces.

The first step in the transportation of Canadian crudes by large diameter pipe line, a feature of the industry destined to become of major significance in its future expansion, was taken when the Inter-provincial Pipe Line Company was incorporated in 1949. Initially the plan was to build and operate a crude oil pipe line, extending from Edmonton to Regina, in order to secure the benefit of the economies in transportation cost which can be obtained through pipe line facilities, as distinct from road and rail transport. This plan was quickly revised to enable Canadian crude to reach more distant markets in Eastern Canada.

The rapid saturation of markets in the prairie region and the discovery of other fields, such as Redwater near Edmonton in 1948, made it desirable to secure additional markets. To the west, the nearest Canadian market was the Vancouver area. To the east, the nearest large Canadian markets were in Ontario. These markets offered prospects of growing requirements for crude oils but the task of supplying them presented difficult transportation problems. They could be reached economically only with large diameter pipe lines. The construction of a large diameter pipe line could not be undertaken until oil reserves and trends in discovery were sufficient to sustain the throughput of a line for the period of years required to amortize the investment. However, these conditions were rapidly fulfilled by the producing industry.



The extension of the market had implications for well-head or field prices. Until 1948 the well-head prices of Alberta crudes were determined by the competition of crudes reaching Regina from the United States so that the well-head prices in Alberta, after allowance for transportation costs to Regina, were equal to the well-head prices of competitive imported crudes, plus their transportation cost to Regina, with any necessary adjustment for foreign exchange. An extension of the market to Eastern Canada involved increased transportation costs and, for this reason, was likely to result in a reduction in well-head prices. It was anticipated that an additional reduction might be necessary to meet the competition of United States crude oils in that eastern Canadian market area and that there would be an overall benefit only if the increased net revenues from the larger volume of oil production more than offset the effect of any reduction in well-head prices.

In late 1950 the Interprovincial Pipe Line Company completed the construction of its pipe line to Superior, Wisconsin. The construction of dock facilities at Superior enabled Canadian crude to be shipped from this point to Sarnia by lake tanker. Investment in large storage capacity at Superior provided for a continuous pumping schedule of oil from Alberta during the closed navigation season. The extension also enabled other refineries within the prairie region and in the Mid-Western area of the United States to be supplied by spur lines. When shipments of Alberta crudes first reached Ontario refineries in 1951, well-head prices of these crudes dropped as much as 44 cents per barrel. Sarnia, the most distant point at which Alberta crudes met United States competition, then became what is commonly referred to in the industry as the "basing point" for well-head prices in Western Canada.

In order to take advantage of the economy of transmission by pipe line, as opposed to lake tanker and associated winter storage, and to meet the increasing Ontario demand for crude oil, the Interprovincial Pipe Line Company in 1953 extended its pipe line from Superior to Sarnia. A further extension of the line to refineries in the Toronto area was made in 1957. This latter extension did not result in any reduction in well-head prices because Western Canada crude could be laid down competitively with United States crudes in Toronto, even after payment of the additional pipe line transportation cost from Sarnia to Toronto.

The initial construction and each subsequent stage of expansion of the Interprovincial pipe line system were based on the assumption by the major oil companies that the competitive position of Canadian crudes in the new market would not deteriorate. Financial risk was involved and guarantees were required to ensure financing. Accordingly, in the original financing of the Interprovincial Pipe Line Company, Imperial Oil Limited undertook sufficient throughput obligations to service the funded debt of the pipe line company. Imperial Oil also made commitments to certain refining companies for delivery of Canadian crude at prices competitive with those of United States crudes, thus enabling these companies to proceed with refinery construction programmes based upon the use of Canadian crude.

#### Westward Expansion from Alberta

British Columbia's refining capacity in 1950 was approximately 28,000 barrels daily. The refineries, all in the Vancouver area, obtained their principal supplies of crude oil from California by tanker. More than half of the total demand for petroleum products in the Province was met by imports, principally from the United States. An expansion of refining capacity in British Columbia and the use of Canadian, rather than imported, crude offered the prospects of a substantial outlet for Canadian crude, which, however, was not adequate to support a pipe line from Alberta.

There were further prospects in the Puget Sound area. The States of Washington and Oregon, which afforded substantial markets for petroleum products, had little refining capacity at the time, although refinery construction was under consideration. For defence reasons the United States Government was concerned that such refineries should obtain their crude oil from a source which did not involve ocean transportation. The demand for petroleum products in California was also rapidly increasing and, with the levelling off of production, less California crude oil was available to supply other States.

These factors, together with the continued development of oil reserves in Alberta and the success of the Canadian oil industry in obtaining financial support from various oil companies in the United States interested in refining Alberta crude oils in the Puget Sound area, led to the incorporation of Trans Mountain Oil Pipe Line Company in the spring of 1951. The principal pipe line facilities of that company were completed by 1953 thus enabling crude oil from the Edmonton area to be transported through them to the refineries of the lower mainland of British Columbia and, by means of a spur line, to the Puget Sound area. In expanding into this market no reduction in well-head prices in Alberta was involved. With well-head prices continuing to be based on competition at Sarnia, Canadian crude had a price advantage in Vancouver and also in the Puget Sound area, even after paying the United States import tariff of  $10\frac{1}{2}$  cents per barrel.

Table IV sets out the changes in posted prices for Redwater crude oil that have taken place since 1948, together with the effective dates and the reasons for these changes. The price changes made in March, 1959, represent a major point of departure in the pricing of Canadian crude oils. As explained later in this report these changes represent essentially an abandonment of the Sarnia basing point and an adjustment of Canadian prices to new competitive forces.

TABLE IV  
CHANGES IN POSTED FIELD PRICES FOR REDWATER CRUDE OIL  
1948-1959

Year	Dates	Posted price dollars per barrel	Major reason for changes in well-head price
1948	Jan - Nov	3.20	
	Dec	2.68	To make Alberta crude competitive at Winnipeg
1949	Sep 24	2.88	Devaluation of the Canadian dollar
1950	Oct 16	2.73	Alteration of exchange rate (Freeing of Canadian dollar)
1951	Apr 24	2.44	To make Alberta crude competitive with Illinois crude at Sarnia
	Jun 1	2.46	Reduction in local pipe line tariff
1952	Apr 23	2.315	Alteration of exchange rate and meeting competition at Sarnia
	Oct 15	2.325	A reduction in Interprovincial pipe line tariff to the Lakehead, offset by currency adjustment
1953	Mar 19	2.385	Alteration of exchange rate and meeting competition at Sarnia
	Jul 21	2.645	Increase in world crude prices reflected at Sarnia and an alteration of exchange rate
1954	Oct 15	2.555	Alteration of exchange rate
1955	Jan 7	2.485	Price change in Illinois crude and some adjustment for alteration of exchange rate
	Feb 1	2.49	Adjustment to local Alberta pipe line tariff change
1957	Jan 16	2.67	General world price increase reflected at Sarnia
	Aug 30	2.63	Alteration of exchange rate
1958	Apr 12	2.56	Alteration of exchange rate and change in Illinois prices
1959	Mar 24	2.42	Reductions in world posted prices and their impact on crude and product prices in Canadian markets.

Source: Alberta Oil and Gas Conservation Board.



### Developments in Other Provinces

Success in Alberta led to increased activity in the search for oil throughout the Western Canada Sedimentary Basin and, particularly, in the Province of Saskatchewan. Until 1953, the heavy black oil found near Lloydminster formed the greater part of the output of that province. It was chiefly used by refineries in Alberta designed to yield primarily bunker C fuel oil and asphalt products. Light crude oil was discovered in southeastern Saskatchewan in 1954. This crude, after the construction of the Westspur pipe line in 1956, found an increasing outlet in Ontario and the Middle West area of the United States, along the route of the Interprovincial Pipe Line Company.

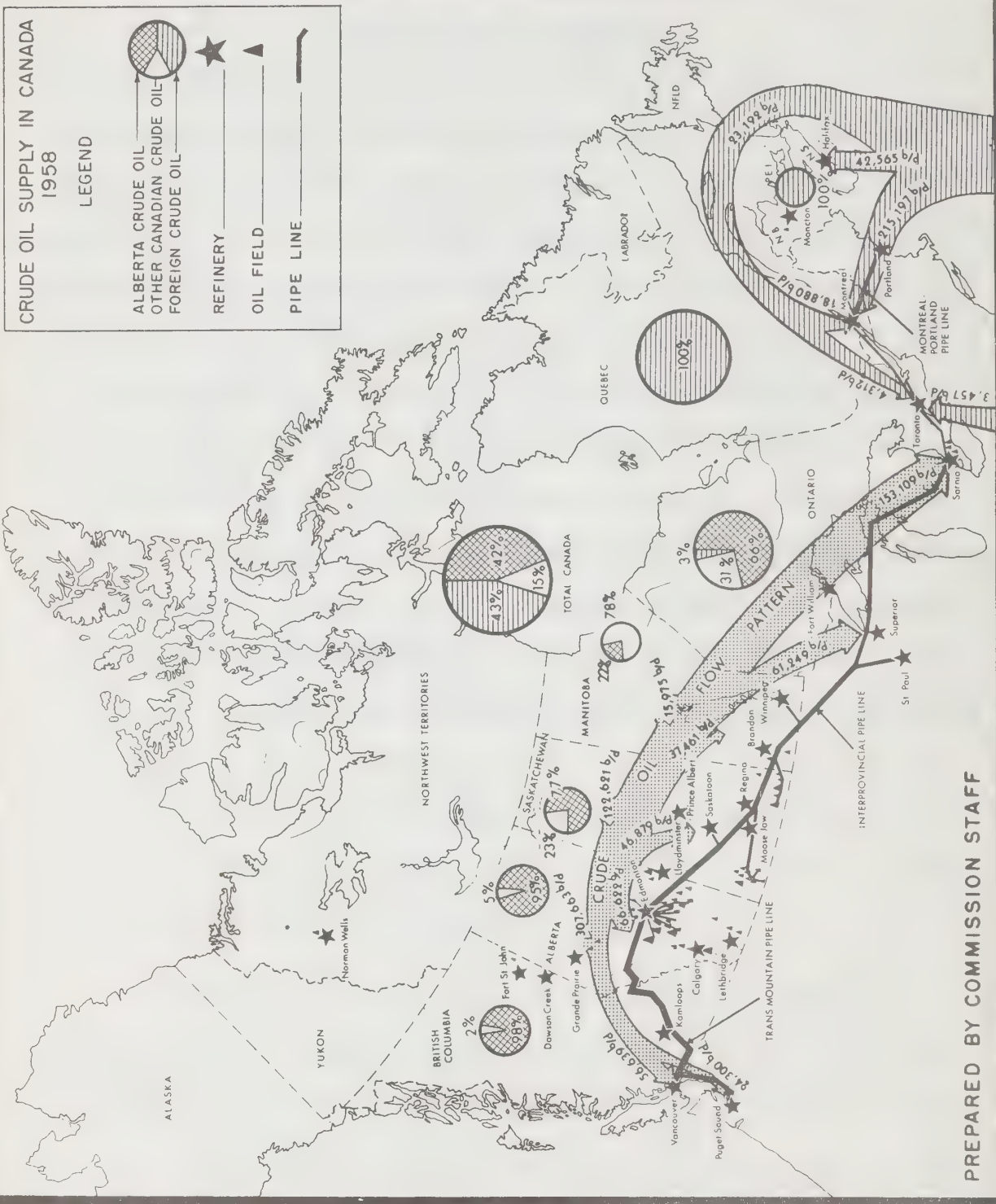
The discoveries of high sulphur, medium gravity crudes in western Saskatchewan in the early 1950's presented a special marketing problem. These crudes were not particularly suitable for use in the accessible refineries of Ontario and the United States. This situation led to the development of an integrated production, transportation and refining operation for the specific purpose of serving a market in the St. Paul area of Minnesota, and involved the construction of a refinery in that area designed to handle these particular crudes.

Production commenced on a small scale in the Virden area of Manitoba in 1951. This area was then linked with the Interprovincial Pipe Line Company's system and the oil transported eastward to market.

Production of crude oil in British Columbia started in 1956. This production, as yet, is relatively small and until now has been refined and marketed locally in the Peace River district of Alberta and British Columbia.

### Achievements of the Industry

Although for decades the oil industry in Canada has been a major one, it had achieved by 1958 the status of one of Canada's most important industries. Large and imaginative investments had been made throughout Canada in the preceding decade in exploration and development, in expanding refinery capacity, in building and expanding oil pipe lines and in providing marketing facilities. These investments, which amounted to some \$4.6 billion, had given the industry a broad operating base offering prospects for continued expansion. Crude oil production had grown steadily and was now occurring in all of the western provinces, with Alberta accounting for some 75 per cent of the total. Production potential had increased even more rapidly. Chart 3, "Crude Oil Supply in Canada 1958", illustrates the principal supply and distribution components of the industry as developed by that year.



### Supply and Demand Trends in Canada

The achievements of the industry are particularly apparent in the change in the source of supply of crude oil used by refiners in Canada. Over the period Canada's oil requirements increased substantially. Canadian refineries in 1947 used 76.8 million barrels of crude oil of which 7.3 million barrels, or  $9\frac{1}{2}$  per cent, were obtained from Canadian oil fields. By 1957 Canadian refinery receipts had reached 238.6 million barrels, of which 126.9 million barrels, or 53 per cent, came from Canadian oil fields. Moreover, in the latter year Canadian crude oil exports amounted to 55.3 million barrels. Consequently, in 1957 Canadian fields produced the equivalent of 76 per cent of the requirements for crude oil at Canadian refineries. In addition, these requirements, during the period 1947-57 had registered a threefold increase. Chart 4, "Supply and Demand of all Oils in Canada 1950-1958", illustrates the growth in the principal components of supply and demand that has taken place in recent years.



SUPPLY AND DEMAND OF ALL OILS IN CANADA 1950-1958

CHART 4

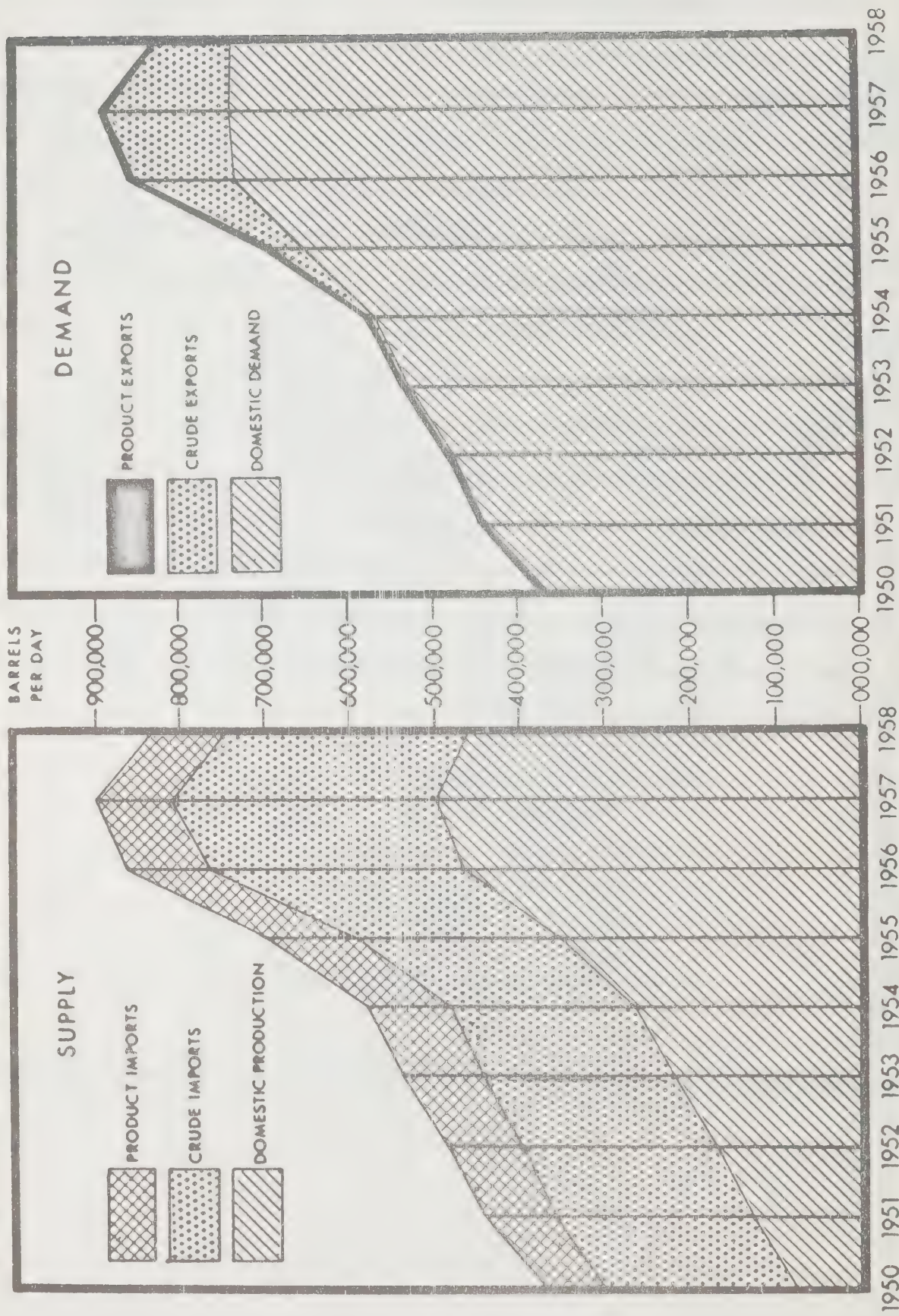


Table V shows that total imports of crude oil into Canada also increased during the period 1950-57 and that these are now largely concentrated in Quebec and in the Maritime Provinces. There has been a progressive decline in imports into all other provinces. The decline in Ontario imports is of particular significance for the Canadian oil industry.

TABLE V  
USE OF FOREIGN AND DOMESTIC CRUDES\*, BY REGIONS  
1950-1958  
(in thousands of barrels daily)

Year	<u>British Columbia</u>		<u>Prairies</u>		<u>Ontario</u>		<u>Quebec and Maritimes</u>		<u>CANADA</u>	
	Im- ports	Total crude supply	Im- ports	Total crude supply	Im- ports	Total crude supply	Im- ports	Total crude supply	Total Imports	Total crude supply
1950	21	21	1	80	69	70	133	133	224	304
1951	22	22	-	93	44	82	162	162	228	359
1952	20	21	-	109	37	93	168	168	225	331
1953	16	23	-	145	30	95	177	177	223	440
1954	5	42	-	126	24	119	181	181	210	468
1955	-	53	-	151	28	139	210	210	238	553
1956	-	60	-	163	25	159	266	267	291	649
1957	-	61	-	153	22	163	284	284	306	661
1958	-	58	-	154	4	160	277	277	281	649

\* Includes crude oil and natural gas liquids.

Sources: Dominion Bureau of Statistics and Provincial Government Publications.

An analysis of the regional supply and demand position in Canada, as appearing in Table VI, shows that in 1957 Canadian crudes had become the sole source of crude oil supply in British Columbia and the Prairie Provinces and the major source in Ontario.

TABLE VI  
SUPPLY AND DEMAND OF ALL OILS, 1957  
(in thousands of barrels daily)

	British Columbia	Prairies	Ontario	Quebec and Maritimes	Total Canada
<u>SUPPLY</u>					
Production (a)	1	504	2	-	507
Imports					
Crude oil	-	-	22	284	306
Products	16	3	24	54	97
Transfers between areas					
Crude oil	61	-196	135	-	-
Products	7	- 5	68	-70	-
New supply	85	306	251	268	910
Stock decrease	-1	-	+5	-11	-7
Total supply	84	306	256	257	903
<u>DEMAND</u>					
Exports					
Crude oil	-	152	-	-	152
Products	5	-	2	2	9
Domestic demand	79	154	254	255	742 <sup>(b)</sup>
Total demand	84	306	256	257	903

(a) Includes production of crude oil, natural gasoline, L.P.G.'s and other blending materials.

(b) Domestic demand increased by 3 per cent in 1958 to some 765,000 barrels a day.

Source: Alberta Oil and Gas Conservation Board.



Growth of Crude Oil Exports

By 1957 exports had risen to an average daily rate of some 152,000 barrels, amounting to a total of 55.3 million barrels for that year. However, in 1958 exports declined to 31.7 million barrels. It should be noted in examining Table VII that the high level of production shown for 1956 and 1957 reflects the abnormally high demand for Canadian oil during the Suez crisis. The decline in production during 1958 was due, to a certain extent, to the loss of export markets which had been temporarily available during the Suez crisis.

TABLE VII  
CRUDE OIL EXPORTS AS RELATED TO  
TOTAL DOMESTIC PRODUCTION

Year	Exports (millions of barrels)	Total production (millions of barrels)	Exports as a percentage of production
1950	-	29.0	-
1951	.3	47.6	0.6
1952	1.4	61.2	2.3
1953	2.5	80.9	3.1
1954	2.3	96.1	2.4
1955	14.8	129.4	11.5
1956	42.9	172.0	25.0
1957	55.7	181.8	30.6
1958	31.7	166.5	19.0

Source: Dominion Bureau of Statistics.



Alberta has been the main source of these exports. Approximately 30 per cent of its total production, i.e., 43.4 million barrels, was exported from Canada in 1957. Saskatchewan exported a further 11.8 million barrels in that year, or 32 per cent of its production. As indicated in Table VII, the decline in exports from Canada in 1958 was the major cause of the first reversal in the steady growth of production experienced by the industry since 1947. The impact of this decline in exports and the resultant curtailment of production was confined to Alberta.

#### The Present Position

Table VIII lists Canadian exports of crude oil by province of origin and illustrates the extent to which total exports have declined during the three years 1956-58. It also shows that the curtailment of production has been confined to Alberta and that exports from Saskatchewan have continued to grow. These marketing trends are further illustrated in Chart 5, "Disposition of Alberta and Saskatchewan Crude Oil 1956-58".

TABLE VIII  
CANADIAN CRUDE OIL DISPOSITION  
BY PROVINCE OF ORIGIN  
(in thousands of barrels per day)

	<u>Alberta</u>		<u>Saskatchewan</u>		<u>Manitoba</u>	
	Exports	Domestic sales	Exports	Domestic sales	Exports	Domestic sales
1956						
January	85.1	294.4	15.7	25.7	-	13.7
February	105.2	289.1	14.2	26.8	-	14.6
March	113.1	275.1	16.2	26.8	-	15.5
April	66.3	282.6	16.0	15.2	-	13.5
May	74.4	254.5	15.7	27.7	-	15.0
June	63.5	289.0	17.8	32.7	-	14.8
July	82.6	315.2	18.6	38.7	-	20.2
August	114.9	321.6	14.9	37.6	-	25.0
September	120.4	305.8	17.2	49.9	-	15.6
October	109.6	290.7	23.5	52.7	-	16.8
November	133.2	292.5	29.5	45.9	-	16.7
December	129.9	296.0	29.1	53.8	7.4	3.0
1956 Average	98.8	292.2	19.0	36.1	0.6	15.4
1957						
January	141.3	277.0	29.4	53.5	8.0	7.9
February	119.7	299.1	30.7	60.2	16.9	0.4
March	137.1	290.0	31.5	58.5	10.2	10.2
April	142.6	253.0	30.5	46.9	9.4	1.5
May	155.0	295.2	33.7	65.6	7.6	-
June	90.4	318.9	34.8	63.0	7.8	17.7
July	111.7	282.8	29.4	72.9	7.1	18.7
August	107.9	319.2	31.2	73.0	7.3	-
September	88.7	265.9	30.2	78.7	5.8	9.1
October	77.7	250.6	35.7	81.8	6.4	-
November	70.0	214.2	27.0	61.9	8.3	17.1
December	83.2	213.7	40.4	83.2	9.0	14.6
1957 Average	110.4	273.3	32.0	66.6	8.6	8.1
1958						
January	66.2	276.2	42.5	85.5	15.8	1.0
February	48.6	275.4	42.6	83.4	12.1	4.7
March	57.2	247.7	43.1	79.2	11.0	5.8
April	35.8	237.2	46.7	66.5	5.3	10.5
May	29.3	249.9	46.6	68.1	5.8	10.8
June	38.1	260.9	40.4	78.7	5.7	11.0
July	40.1	270.0	40.0	87.6	5.2	11.4
August	26.9	288.6	40.0	89.5	4.5	11.3
September	35.2	237.5	40.3	88.0	3.0	12.4
October	17.9	266.9	35.4	88.1	5.9	9.3
November	24.9	308.9	32.4	86.0	12.5	2.4
December	23.7	329.1	36.8	84.0	9.3	5.0
1958 Average	37.0	270.7	40.6	82.1	8.0	8.0

Source: Prepared by Commission staff from provincial government sources.

CHART 5

DISPOSITION OF ALBERTA AND  
SASKATCHEWAN CRUDE OIL  
1956-1958

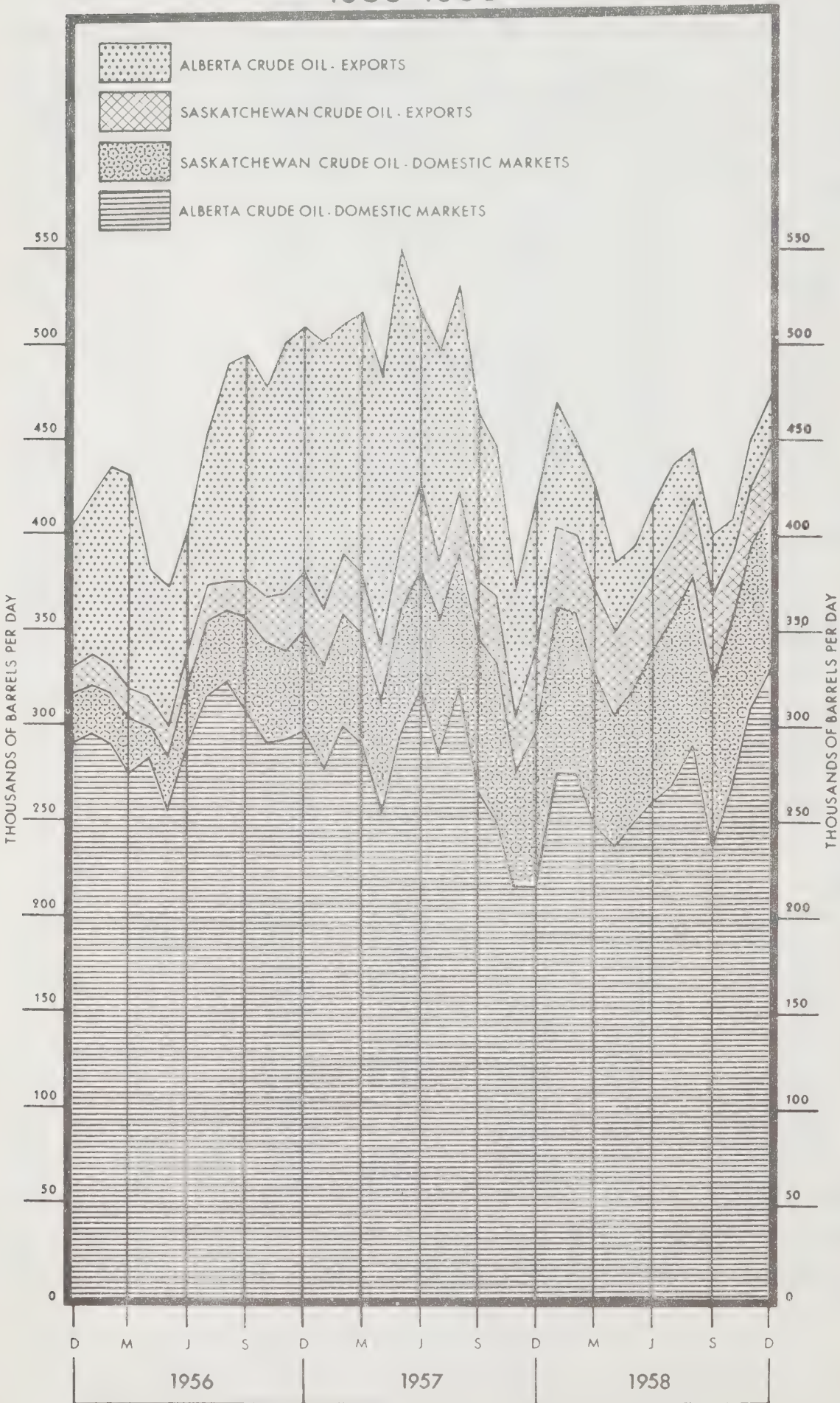




Table VIII also shows that, in contrast to the export record, no comparable decline in sales to the domestic market has occurred. Such domestic sales, however, showed no appreciable increase in 1958 due largely to the fact that demand for petroleum products increased by only three per cent in Canada compared with an average annual increase of 12 per cent since 1947. There was also some liquidation of inventories. In 1958, Saskatchewan's sales increased whereas those of Alberta declined. During the past few years Saskatchewan has secured an increasing share of the Canadian market as well as of the export market. This province's share of total domestic production of crude oil rose from 3 to 27 per cent in the period 1952-58. Canada's self-sufficiency in oil, after taking account of exports and imports, declined from 67 per cent in 1957 to 60 per cent in 1958, due to the decline in crude oil exports.

New discoveries in Western Canada and the decline in the export market caused a substantial decrease in 1958 in the ratio of production to the industry's capacity to produce. This was particularly true for the Province of Alberta.



TABLE IX  
ACTUAL PRODUCTION AS A PERCENTAGE OF  
POTENTIAL PRODUCTION - 1956-1958  
ALBERTA AND SASKATCHEWAN<sup>(a)</sup>  
(in thousands of barrels daily average)

Year	Alberta			Saskatchewan		
	Production	Potential	Percentage	Production	Potential	Percentage
1956	393	684	58.7	58	68	85
1957	377	756	50.7	101	125	81
1958	310	793	39.2	125	175	79

(a) The combined production of Manitoba and British Columbia accounts for only 3 per cent of Western Canada output and is not considered in this table.

Source: Submission by Oil and Gas Conservation Board of Alberta.

In the latter part of 1957 and during 1958 there was a substantial decline in exploration and development expenditures in the producing sector of the industry. An early 1959 estimate of the Canadian Petroleum Association indicates that development expenditures declined from \$242 million in 1957 to \$150 million in 1958, while exploration expenditures declined from \$305 million to \$290 million. The drop in expenditures reflected, in part, a reduction in the cost of drilling, which in itself was related to the lower level of exploration and development. The number of wells drilled in all categories, however, declined from approximately 3,000 in 1957 to just over 2,500 in 1958. The decline in expenditures for development was greater than that for exploration. This arose in part from the completion of several field development programmes. Exploratory drilling declined from

1,058 wells in 1957 to 849 in 1958.

The reduction in the expenditures on oil drilling as such has been greater than the figures would suggest as they include increased expenditures made in an accelerated search for natural gas. The decline in oil drilling might have been greater but for the fact that the long-term nature of exploratory programmes tended to lessen the influence of adverse market conditions on oil exploration. In addition the necessity on the part of the industry to fulfil certain drilling obligations and certain regulations under provincial Statutes assisted in maintaining expenditures on both exploration and development.

The decrease in the industry's expenditures generally in 1958 resulted, inter alia, from the combination of a decline in export markets, a general slackening in business activity and a lower than anticipated Canadian demand for petroleum products. The decline in actual and prospective export markets appears to have been the most significant factor. The tapering off in field activity has led to the incorporation of fewer companies and to an increase in the number of company mergers.

It is clear, from testimony given to the Commission, that the loss of export markets for oil is a matter of great concern to the industry and to government authorities. Consequently we have considered it advisable to examine the industry's experience in these export markets and to endeavour to assess the extent to which these or other markets may become available to Canada in the future.



## CHAPTER 3

### EXPORT OF CANADIAN OIL

Exports of Canadian crude oil have had a short history and, with a few negligible exceptions, have been limited to the United States of America. The first export was from Alberta in 1951 and was incidental to the movement of crude oil into Ontario markets. The facilities of the Interprovincial Pipe Line Company, passing through the States of Minnesota and Wisconsin en route to the head of Lake Superior, were linked to two relatively small refineries in the United States. Similarly, when the line was extended to Sarnia, through the northern part of the State of Michigan, other United States' refiners became purchasers of relatively minor quantities of Canadian crude oil.

### The Pacific Northwest Market

The first project deliberately designed to carry crude oil into export markets was that of the Trans Mountain Oil Pipe Line Company Limited. In the spring of 1951 Alberta crude production had reached 126,000 barrels daily or 60 per cent of its then potential output. On the basis of new discoveries which had taken place, it was estimated that the potential output in Alberta would be 325,000 barrels per day by 1953. This would have been more than enough to sustain the anticipated increase in the requirements of the Ontario market, which was already being served, in part, by Alberta crudes. West of the Rocky Mountains a marketing area existed in which it appeared that a large volume of Alberta crude oil might be sold. The British Columbia demand for crude oil and petroleum products, amounting to 46,000 barrels daily in 1950,



was being met by imports of some 23,000 barrels a day of California crude oil and a similar quantity of products. A small volume of products was also received from Alberta. The projected expansion of refining capacity in Vancouver was a contributing factor in the decision to construct a pipe line from Edmonton to transport western Canadian crudes to the Pacific Coast.

The Pacific Northwest area, i.e., the States of Washington, Oregon and Idaho, was another prospective market. The refining capacity in that area was only 12,000 barrels per day and there was a demand for approximately 200,000 barrels daily of petroleum products. The building of additional refineries in the area was therefore under consideration. There was no local production of crude oil and the demand for both crude and products was met from California. The refining capacity of California was adequate to meet all civilian and military requirements of the area west of the Rocky Mountains. However, the United States Petroleum Administration for Defense, in an appraisal of the situation in 1951, concluded that the growth of reserves in California was not keeping pace with the growth in demand. This meant that, unless additional reserves could be established in California, an alternative source of crude oil for the proposed refineries in the Puget Sound area would be needed.

Although imports could be secured from a number of foreign sources, strategic factors favoured the development of a source of supply in Canada. In assessing the supply and demand situation in the Pacific Northwest the Petroleum Administration for Defense in a report, published in December, 1951, found that the foreseeable local supplies of crude oil for District V, which included the Pacific Coast States, would not be adequate to meet anticipated demands, unless certain special oil reserves held by the United States Navy were made available. There were

six alternative supply possibilities. These included imports by tanker from the Eastern Hemisphere, from the Caribbean area and from the United States Gulf Coast, shipments by pipe line from the West Texas-New Mexico area and from the Rocky Mountain area, or imports by pipe line from Canada. An appraisal of these alternatives indicated that imports of crude oil by pipe line from Canada, to supplement the supplies of District V, was definitely advantageous in terms of defence requirements. One of the main advantages was that Canadian crude oil could be moved over-land to the Pacific Northwest whereas supplies from foreign areas would have to be transported by the more vulnerable ocean routes. Accordingly the Petroleum Administration for Defense concluded that:

"It is impossible to evaluate all eventualities bearing on this problem. Most of them are secondary to the major consideration of the defense needs of the Pacific Northwest and the desirability of making available to a market as much producible crude oil in the Western Hemisphere as possible. No practical means of accomplishing these desired defense considerations other than an Alberta-Puget Sound pipeline is apparent. The crude oil pipeline from Alberta to the Puget Sound area is recommended, therefore, with the construction of increased refining capacity. The Petroleum Administration for Defense should assist in acquisition of steel to this end."

The Government of Canada in a note to the Government of the United States, dated March 8, 1955, referred to the defence considerations which had entered into the planning of the Trans Mountain pipe line:

"It will be remembered that the United States Navy on strategic grounds gave support to the construction of the Trans Mountain pipe line and for the construction of additional refining capacity in the State of Washington."

This approach to the problems of continental defence was in harmony with an earlier agreement between Canada and the United States on the principles of economic co-operation on defence matters as set out in an exchange of notes in 1950. In a note of October 26,

1950, the Secretary of State for the United States declared:

"The United States and Canada have achieved a high degree of cooperation in the field of industrial mobilization during and since World War II through the operation of the principles embodied in the Hyde Park Agreement of 1941, through the extension of its concepts in the post-war period and more recently through the work of the Joint Industrial Mobilization Planning Committee. In the interests of mutual security and to assist both governments to discharge their obligations under the United Nations Charter and the North Atlantic Treaty, it is believed that this field of common action should be further extended. It is agreed, therefore, that our two governments shall cooperate in all respects practicable, and to the extent of their respective executive powers, to the end that the economic efforts of the two countries be coordinated for the common defense and that the production and resources of both countries be used for the best combined results."

"The following principles are established for the purpose of facilitating these objectives:

1. In order to achieve an optimum production of goods essential for the common defense, the two countries shall develop a coordinated program of requirements, production and procurement.
2. To this end, the two countries shall, as it becomes necessary, institute coordinated controls over the distribution of scarce raw materials and supplies.
3. Such United States and Canadian emergency controls shall be mutually consistent in their objectives, and shall be so designed and administered as to achieve comparable effects in each country. To the extent possible, there shall be consultation to this end prior to the institution of any system of controls in either country which affects the other.
4. In order to facilitate essential production, the technical knowledge and productive skills involved in such production within both countries shall, where feasible, be freely exchanged.
5. Barriers which impede the flow between Canada and the United States of goods essential for the common defense effort should be removed as far as possible.
6. The two governments, through their appropriate agencies, will consult concerning any financial or foreign exchange problems which may arise as a result of the implementation of this agreement."

Following the outbreak of the Korean War in 1950, the United States Petroleum Administration for Defense took action, on occasion, to assist in the maintenance of a high level of oil exploration and development in Western Canada.

For example, it helped to obtain priority in the allocation of steel and other scarce materials produced in the United States.

The Canadian oil industry had been studying, since 1950, the possibilities of new markets on the Pacific Coast. The possibility of using Canadian crudes in the refineries of British Columbia and the favourable competitive position of Alberta crudes in the Pacific Northwest markets, when compared to California and overseas oils, were considered to justify the building of a pipe line from Alberta to the Pacific Coast. The outbreak of the Korean War and defence considerations hastened the decision to build the pipe line. Trans Mountain Oil Pipe Line Company commenced construction of this second major venture in oil pipe lines in Canada in 1952. This involved the construction of a pipe line from Edmonton to Vancouver and the Puget Sound area. In view of its importance in terms of continental defence, steel was allocated to the project from United States sources.

Six oil companies with refining capacity on the West Coast supported the Trans Mountain pipe line project by becoming shareholders in the Company and by entering into deficiency agreements to ensure payment of the interest on and amortization of the first mortgage bonds. The interest held by these companies, at the time of the initial financing and in March, 1958, is shown in Table X.



TABLE X  
SUMMARY OF TRANS MOUNTAIN SHAREHOLDINGS

Company	Number of Shares	
	Original issue 1951	March 27, 1958
Deficiency agreement guarantors		
Imperial Oil Limited	130,000	130,000
Shell Oil Company of Canada Limited	130,000	130,000
Standard Oil Company of British Columbia Limited	130,000	130,000
Canadian Gulf Oil Company (now The British American Oil Company Ltd.)	130,000	130,000
Union Oil Company of California	100,000	-
Richfield Oil Corporation	50,000	50,000
Other oil companies	250,000	53,025
	920,000	623,025
All other shareholders	580,028	881,903
Total shares outstanding	1,500,028	1,504,928

Source: Submission by Trans Mountain Oil Pipe Line Company.

The bulk of the funds for the Trans Mountain oil pipe line was raised by first mortgage bonds. Imperial Oil Limited, through its deficiency agreement, in effect guaranteed 54.2 per cent of the \$65 million initially raised in this way in 1952. The obligations of Canadian Gulf Oil Company (now The British American Oil Company Limited), Shell Oil Company of Canada Limited and Standard Oil Company of British Columbia Limited, under these deficiency agreements, were unconditionally guaranteed by their parent companies in the United States, i.e., by Gulf Oil Corporation, Shell Oil Company and Standard Oil Company of California, respectively. Two further deficiency agreements were entered into in 1954 and 1957 by all these companies, except Union Oil Company of California.

The initial capacity planned for the Trans Mountain line was 75,000 barrels daily, involving a 24-inch line with two pumping stations.

However, as construction proceeded, certain developments took place which suggested that a larger throughput could be marketed. In 1952 General Petroleum Corporation announced plans for the construction of a refinery, near Ferndale, Washington, with a capacity of 35,000 barrels per day, to be completed in 1954. In 1953, Shell Oil Company commenced construction at Anacortes, Washington, of a refinery with a capacity of 55,000 barrels per day. This refinery was completed in the summer of 1955. These developments resulted in Trans Mountain adding two additional pumping stations before the completion of the line, thereby increasing the capacity to 150,000 barrels per day. A spur line was also built from the main line to serve the new refineries at Ferndale and Anacortes. This spur line is operated by Trans Mountain Oil Pipe Line Corporation, a United States subsidiary of the Canadian Company. Shipments to Vancouver refineries commenced in 1953 and to the Puget Sound area in 1954. During the last half of 1955 the throughput of Trans Mountain rapidly increased as refinery demand rose and by December the line was transporting some 100,000 barrels per day, with about 52,000 barrels daily being shipped across the international border to the two refineries at Ferndale and Anacortes. At this time these two refineries represented approximately 90 per cent of the total refining capacity of the Puget Sound area.

As will be seen from Table XI, exports to the Puget Sound area continued to grow in 1955 and early 1956 and, after some decline in the mid-year, reached a level approaching the refinery capacity of the area during the latter part of 1956, due to the imminence of the closure of the Suez Canal. This position also held throughout the first half of 1957. In early 1957, during the actual Suez crisis, the Trans Mountain line operated at its full capacity of 200,000 barrels daily. The demand for crude oil in the Puget Sound and California areas was such that, had the capacity of the pipe line been greater, more crude could have been

marketed on the West Coast of the United States at that time.

As a result of this unexpected increase in demand Trans Mountain further expanded its pipe line facilities. A fifth and sixth pumping station were added in 1956. In 1957 two 51-mile sections of line were looped with 30-inch pipe and one additional permanent and three temporary pumping stations were added. Construction was also begun on new wharfage facilities at Vancouver. The total capacity of the line was thus increased to 250,000 barrels daily.

TABLE XI  
EXPORTS OF ALBERTA CRUDE FROM CANADA  
TO THE WEST COAST OF THE UNITED STATES, 1955-1958  
(in barrels per day)

Month	1955	1956		1957		1958
	Puget Sound	Puget Sound	Offshore	Puget Sound	Offshore	Puget Sound
January	13,565	48,940	3,835	84,859	33,369	52,181
February	14,578	69,101	-	75,219	26,608	35,614
March	27,482	69,898	2,743	68,535	46,368	42,789
April	25,867	24,409	7,032	83,469	44,485	30,958
May	27,411	26,096	15,740	76,338	59,324	19,286
June	23,116	30,957	4,061	58,861	14,071	24,873
July	27,213	23,915	27,427	94,002	2,778	27,690
August	34,443	57,040	31,935	86,068	3,898	13,845
September	37,509	61,965	32,812	74,146	4,047	10,705
October	45,923	73,438	17,732	68,191	-	10,380
November	42,734	75,406	25,143	54,955	-	13,272
December	51,858	69,232	34,690	65,388	-	10,002
Monthly average	30,975	52,533	16,929	74,169	19,579	24,300

Source: Alberta Oil and Gas Conservation Board.

Table XI also shows, under the column "Offshore", the commencement of shipments of Alberta crude by tanker to the California market early in 1956. In the latter part of 1955, spot tanker rates, which had been

relatively low at the time of the construction of the Trans Mountain pipe line, progressively increased in anticipation of the Suez crisis and the resultant shortage of tankers. These tanker rates rose to as high as USMC plus 125,\* i.e., 125 per cent above the ceiling rates enforced by the United States Maritime Commission in World War II for United States Government tanker commitments. These high rates were in contrast to rates as low as USMC minus 30 which had prevailed earlier in 1955. In consequence, Alberta oil, which had been competitive in California with foreign crudes, became even more attractive in terms of price. The first tanker shipment to San Francisco was loaded at Vancouver on January 1, 1956. Later in that year, with the outbreak of the Suez crisis and the accompanying shortage of ocean tankers, leading to even higher tanker rates, this offshore movement rose substantially with the result that exports to California by tanker in 1956 totalled six million barrels. The competitive position of Canadian crudes was further improved early in 1957 because of relatively greater increases in the posted prices of competing crudes and this offshore movement reached a peak of almost 60,000 barrels per day in 1957. Among the consignees were two of the largest refiners in the San Francisco Bay area, Tidewater Oil Company and Standard Oil of California. Further south, the Richfield Oil Corporation purchased Alberta crude at Los Angeles, while the U.S. Oil and Refining Company at Tacoma, in the Puget Sound region, also made some purchases.

As the Suez crisis waned, Middle East and Far East crudes again began to move into their former world markets, including the United States Pacific Coast. The increased supply of new tankers, in addition to the number of older ones which had been recalled into service, brought about

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\* The former USMC rates, established for each of the major supply routes, no longer have official significance but they form a standard of reference against which the market level at any given time can be readily measured and expressed. Originally, these rates were equal to those enforced by the U.K. Ministry of Transport. Post-war currency restrictions resulted in the use of two separate scales for quotations of tanker rates. The USMC rates have remained the standard of reference for the dollar market, while the London Market Tanker Nominal Freight Scale plays the same role for the sterling market.



a sharp drop in tanker rates, thereby reducing the price advantage of Canadian crude. The existence of inventories of crude oil and products, which had been built up in West Coast areas of the United States against a possible period of scarcity, contributed to the declining demand for Canadian crude. By October, 1957, shipments to the Puget Sound area had declined considerably and offshore movements had ceased altogether. This decline continued into 1958. Thus, by the time the expansion of the capacity of the Trans Mountain pipe line was completed in 1957, the demand had dropped and by the autumn of 1958, due in part to the introduction of import controls by the United States Government, exports of Canadian crudes to the Pacific Coast had decreased to some 11,000 barrels daily, all of which was moving into the Puget Sound area.

#### The Middle West Market

Canadian crude oil exports to the Middle West area of the United States experienced a fairly satisfactory growth during the period 1955-58. As noted earlier, the Interprovincial pipe line system runs through an extensive area of United States territory. This enabled Canadian crude to reach certain refineries along its route as early as 1951.

Table XII lists those refineries in the Middle West States which in 1958 obtained a portion of their crude oil requirements from Canada through the Interprovincial pipe line system. These refineries are described in terms of their total crude oil refining capacity which does not, of course, indicate the actual purchases of Canadian crude.

TABLE XII  
UNITED STATES MIDDLE WEST PURCHASERS OF CANADIAN CRUDE  
AS OF MARCH, 1958

(refining capacity in barrels per calendar day)

Company	Location	Capacity
Lake Superior Refining Co.	Superior, Wis.	12,000
International Refineries, Inc.	Wrenshall, Minn.	11,000
Great Northern Oil Co.	Pine Bend, Minn.	31,400
Northwestern Refining Co.	St. Paul Park, Minn.	16,000
" " "	New Brighton, Minn.	2,500
Bay Refining Corp.	Bay City, Mich.	9,950
West Branch Refineries, Inc.	West Branch, Mich.	<u>5,000</u>
	Total	87,850

Source: Oil and Gas Journal, March, 1958.

For the first few years, the Canadian crudes exported to the Middle West markets came from Alberta. During the summer of 1955, however, crude oil began to move out of Saskatchewan to a new market in the St. Paul-Minneapolis area. Soon after the initial discoveries of petroleum in the southwestern corner of that province, it became apparent that markets did not exist for the quantities of medium gravity crude, of high sulphur content, that these fields were capable of producing. There were no refineries in Canada or in the Great Lakes area of the United States designed to process oil of such quality. Certain producing companies, Mobil Oil of Canada, Woodley Canadian Oil Company and Southern Production Company (subsequently purchased by Sinclair Canada Oil Company), took the initiative in providing their own outlet. The first step was the construction of the South Saskatchewan pipe line system,

consisting of gathering systems in the fields involved and a trunk line which connected with the Interprovincial pipe line at Regina. In the United States a take-off line, owned by the Minnesota Pipe Line Company, was built from the Lakehead pipe line system at Clearbrook, Minnesota, to the St. Paul area. A modern refinery, specially designed to process these Saskatchewan medium crudes, was constructed at St. Paul by the Great Northern Oil Company, which was controlled by Woodley Petroleum Company and Sinclair Refining Company.

Another subsidiary of Woodley Petroleum Company and Sinclair Refining Company, the Great Northern Oil Purchasing Company, was formed to purchase Saskatchewan medium crude oils, including those produced by its affiliated companies. To facilitate the financing of these developments several long-term contractual commitments were made with oil producing companies. Thus, through these integrated arrangements, a marketing outlet was developed for an important Canadian source of this medium gravity crude.

The orderly and economic development of the southeastern Saskatchewan oil fields was assisted by the construction of other pipe line facilities connecting oil fields in this part of the Province to the Interprovincial pipe line system at Cromer, Manitoba, thereby making additional Saskatchewan crudes accessible to export markets. These crudes are of light as well as of medium gravity. Some of these crudes have been exported from Saskatchewan to markets in the Middle West area of the United States. The first delivery of southeastern Saskatchewan oil by pipe line to the Interprovincial pipe line system took place in July, 1956, on completion of the Westspur pipe line. This pipe line system was constructed by the Westspur Pipe Line Company, which was incorporated as an interprovincial pipe line company in May, 1955, under the sponsorship of a number of the producing companies operating in southeastern Saskatchewan fields.

As Table XIII shows, exports of light crudes from Alberta into Middle West refineries increased to substantial quantities. Towards the end of 1956 Manitoba crude also began to move into Minnesota, for use by the Northwestern Refinery Company in the St. Paul area, via the newly constructed Trans-Prairie pipe line and the Interprovincial pipe line. The table also suggests that since 1956 the growth of exports from Saskatchewan was achieved partly at the expense of exports from Alberta. The effect of the Suez crisis on the export of Canadian crude to the Middle West was not significant.

Markets in the Middle West States, to which Canadian oil has been exported, constitute only a small portion of the total market in what might be referred to as the Great Lakes area. This area lies to the south and east of Minnesota, where Canadian oil currently has a market, and comprises the States of Illinois, Indiana, Ohio, Michigan and Wisconsin. The refinery capacity of the Great Lakes area, as at January, 1958, was approximately one million barrels per day, after deducting the refinery capacity of the Wood River - St. Louis district, geographically a fringe area in southern Illinois. The demand for petroleum products in the Great Lakes area is considerably greater than this figure would suggest, as refinery capacity has only been sufficient to supply approximately two-thirds of the total petroleum product demand. The refineries in this area in 1958 were as follows:

<u>Company</u>	<u>Number of refineries</u>	<u>Crude oil capacity (barrels per day)</u>
Ashland Oil & Refining Co.	3	72,000
Aurora Gasoline Co.	2	59,500
Cities Service Co.	1	53,000
Clark Oil & Refining Corp.	1	30,000
Gulf Oil Corp.	1	42,000
Naph-Sol Refining Co.	1	5,250
Pure Oil Co.	3	103,900
Sinclair Refining	1	111,000
Socony Mobil Oil Co.	3	91,500
Standard Oil Co. (Indiana)	1	209,000
Standard Oil Co. of Ohio	3	122,000
Sun Oil Co.	1	95,000
The Texas Co.	1	65,000
	<u>22</u>	<u>1,059,150</u>



TABLE XIII

## EXPORTS OF CANADIAN CRUDE

TO THE MIDDLE WEST OF THE UNITED STATES, 1955-1958

(in thousands of barrels per day)

Month	1955			1956			1957			1958					
	Alta.	Sask.	Total	Alta.	Sask.	Man.	Total	Alta.	Sask.	Man.	Total				
January	6.7	-	6.7	32.3	15.7	-	48.0	23.1	29.4	8.0	60.5	14.0	42.5	15.8	72.3
February	5.1	-	5.1	36.1	14.2	-	50.3	17.9	30.7	16.9	65.5	13.0	42.6	12.1	67.7
March	5.8	-	5.8	40.4	16.2	-	56.6	22.2	31.5	10.2	63.9	14.4	43.1	11.0	68.5
April	6.2	-	6.2	34.8	16.0	-	50.8	14.7	30.5	9.4	54.6	4.7	46.7	5.3	56.7
May	1.5	-	1.5	32.5	15.7	-	48.2	19.3	33.7	7.6	60.6	10.0	46.6	5.8	62.4
June	6.0	18.1	24.1	28.4	17.8	-	46.2	17.5	34.8	7.8	60.1	13.3	40.4	5.7	59.4
July	6.6	9.9	16.5	31.2	18.6	-	49.8	15.0	29.4	7.1	51.5	12.4	40.0	5.2	57.6
August	9.6	11.0	20.6	26.0	14.9	-	40.9	17.9	31.2	7.3	56.4	13.0	40.0	4.5	57.5
September	5.5	5.8	11.3	25.6	17.2	-	42.8	10.5	30.2	5.8	46.5	24.5	40.3	3.0	67.8
October	9.7	12.4	22.1	18.4	23.5	-	41.9	9.5	35.7	6.4	51.6	7.5	35.4	5.9	48.8
November	21.0	11.5	32.5	32.6	29.5	-	62.1	15.0	27.0	8.3	50.3	11.6	32.4	12.5	56.5
December	25.4	12.2	37.6	26.0	29.1	7.4	62.5	17.8	40.4	9.0	67.2	13.6	36.8	9.3	59.7
Monthly average	9.1	6.7	15.8	30.4	19.0	0.6	50.0	16.7	32.0	8.7	57.4	12.7	40.6	8.0	61.3

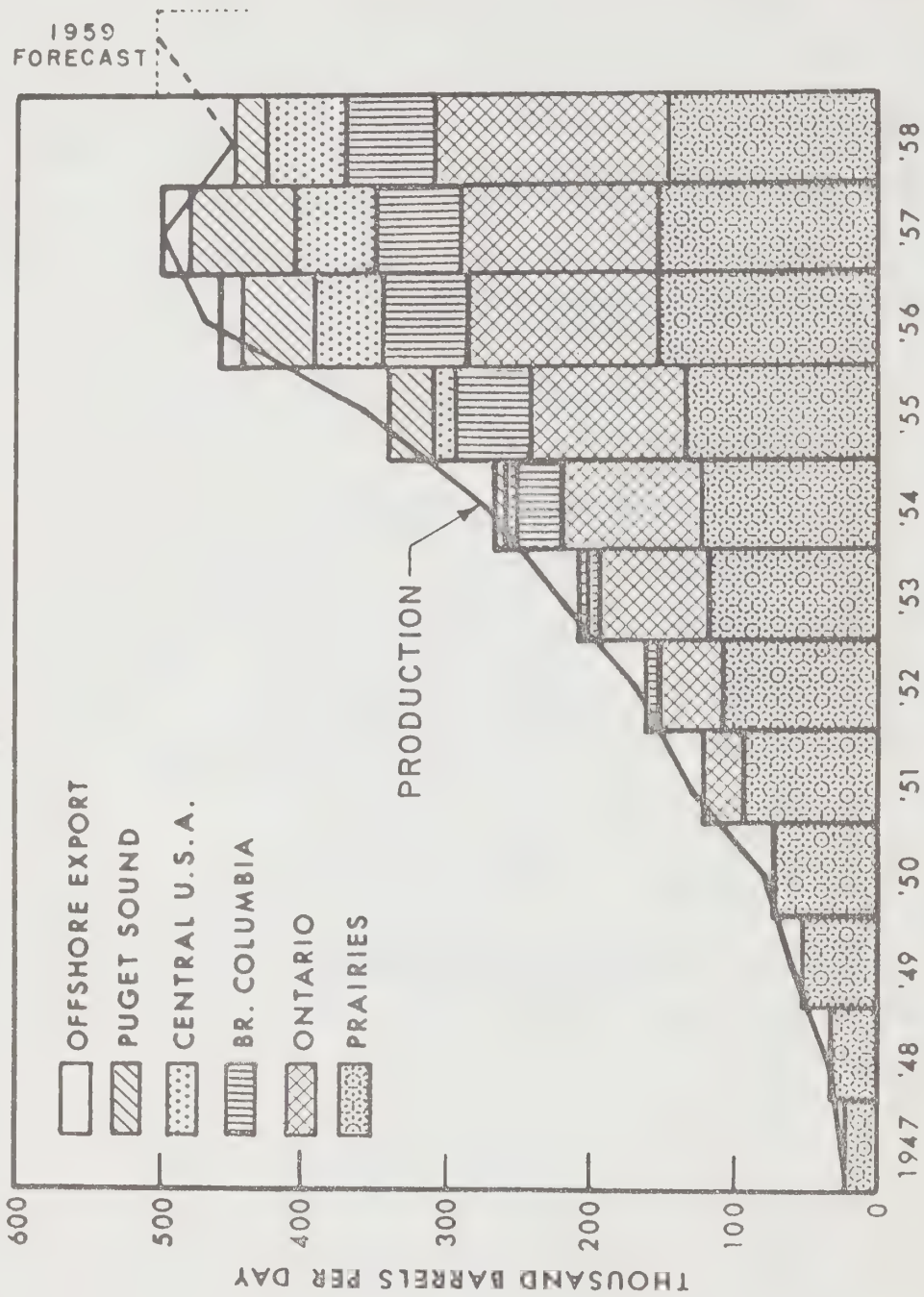
Source: Provincial governments.

Most, but not all, of these refineries have sources of crude oil in the Mid-Continent and Gulf Coast areas and are served by pipe line facilities which have been developed on a company affiliation basis. Although this refinery market of some one million barrels per day is large and should constitute a good prospect for Canadian crude, there undoubtedly exists a strong preference by the United States refineries concerned to continue using their existing sources of crude and their existing pipe line facilities. Canadian oil has, as yet, made no significant entry into this very large market. However, as present pipe lines supplying this United States market reach capacity operation and new pipe lines become necessary Canadian crude might find an outlet in this area. It should be noted that some of these refiners are owners of proven reserves of Canadian crude.

The importance of the growth of exports to the Puget Sound and Middle West markets in the expansion of the Canadian oil industry is illustrated in Chart 6, "Disposition of Canadian Crude Oil 1947-1958."

CHART 6

DISPOSITION OF CANADIAN CRUDE OIL  
1947-1958



SOURCE: IMPERIAL OIL LIMITED

United States Import Policy

Agitation by sections of the oil producing industry in the United States against imports of foreign oils is not new. In the 1930's protests led to the imposition of import duties and quotas on imports of crude oils and products. These restrictions were successively modified during World War II. During the decade following World War II, the position of the United States changed from that of a net exporter of oil to that of a net importer. The narrow margin by which the nation had managed to meet essential requirements during World War II had led to widespread concern as to the adequacy of domestic reserves and productive capacity. Thus, in the early post-war period, the policy of the United States favoured the increased importation of foreign oil and a reduction of exports, although by 1946 the question of controlling imports had again become controversial. The abnormally cold winter of 1946-47 caused a temporary lessening of pressure for controls on imports. In 1949 the National Petroleum Council issued a report recommending that imports be permitted to supplement, rather than to supplant, domestic production on the grounds that a constant supply of oil to meet national needs must depend primarily on domestic sources. The Korean War further postponed any action by the United States on the import problem.

In 1952, as the result of the revision of a trade agreement between the United States and Venezuela, the duty on crude and fuel oil imported into the United States was reduced.\* This reduction applied,

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\* For crude and fuel oil of less than 25° A.P.I. gravity the duty became 5¼ cents per barrel while for petroleum of higher gravities it was set at 10½ cents per barrel, regardless of the quantities imported. From 1939 to 1943 and 1950 to 1952, the duty had been 10½ cents per barrel up to 5 per cent of the domestic refinery runs of the previous year and 21 cents per barrel on volumes exceeding this quota. From 1943-50, there was a 10½ cent duty per barrel, without limitation as to amount.



in effect, to crude and fuel oil from any foreign source.

As will be seen from Table XIV the ratio of imports to domestic production in the United States increased steadily between 1946 and 1954. In 1946 imports amounted to five per cent of domestic production whereas in 1954 they had risen to 10.3 per cent.

TABLE XIV

UNITED STATES CRUDE OIL PRODUCTION AND IMPORTS, 1939-1958

(in thousands of barrels)

Year	Domestic production	Crude oil imports	Product imports	Per cent crude imports/production
1939	1,264,962	33,095	25,965	2.6
1940	1,353,214	42,662	41,089	3.2
1941	1,402,228	50,606	46,536	3.6
1942	1,386,645	12,297	23,669	0.9
1943	1,505,613	13,833	49,579	0.9
1944	1,677,904	44,805	47,506	2.7
1945	1,713,655	74,337	39,282	4.3
1946	1,733,939	86,066	51,610	5.0
1947	1,856,987	97,532	61,857	5.3
1948	2,020,185	129,093	59,051	6.4
1949	1,841,940	153,686	81,873	8.3
1950	1,973,574	177,714	132,547	9.0
1951	2,247,711	179,073	129,121	8.0
1952	2,289,836	209,591	138,916	9.2
1953	2,357,032	236,455	141,044	10.0
1954	2,314,988	239,479	144,476	10.3
1955	2,484,428	285,421	170,143	11.5
1956	2,617,283	341,833	183,758	13.1
1957	2,618,884	363,788	199,900	13.9
1958	2,448,055	350,765	264,260	14.3

Source: United States Bureau of Mines. 1958 figures are preliminary estimates.

The ratio of production to productive capacity over the period 1946-54 had fallen from 97 to 77 per cent.\* This led to a renewed interest on the part of some sections of the industry in the United States in restricting imports and resulted in appeals for voluntary import controls. In the summer of 1954, however, the Cabinet Advisory Committee on Energy Supplies and Resources Policy suggested a method of striking a balance between domestic and foreign supplies, so that imports into the United States would "supplement but not supplant" domestic oil. This Committee's recommendation, made in 1955, envisaged a voluntary scheme under which the 1954 ratio of crude and residual fuel oil imports to domestic production would be maintained. The 1955 National Defense Amendment to the Trade Agreements Extension Act authorized the President to adjust oil imports whenever they appeared to him to threaten the national security. Although it was recognized that a continuance of the trend towards increased imports would adversely affect producers, particularly the smaller independent operators, no immediate action was taken under this legislation.

A further increase in imports aggravated the situation, however, and, on August 8, 1955, the Director of the Office of Defense Mobilization called upon the oil companies to curtail their petroleum imports. The United States Government thus sought to achieve the desired balance between imported and domestic crude through voluntary limitations by importing companies. Nevertheless, imports of

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\* In a statement issued in 1956 on the "Relationship of U.S. Oil Imports to Domestic Oil Production", the Cabinet Advisory Committee on Energy Supplies and Resources Policy described the idle capacity of the United States crude oil producing industry as having grown from 25,000 barrels per day in 1948 to 2,029,000 barrels daily by 1956. American Petroleum Institute estimates placed the 1957 idle capacity at 2,707,000 barrels per day and various industry sources indicated a similar amount of spare productive capacity in 1958, although such estimates do not necessarily imply that transportation facilities exist to enable total productive capacity to be brought to market.

Canadian and Venezuelan crudes were at this time specifically exempted from such limitations, partly on strategic grounds and partly because the quantities imported, as related to domestic production, appeared unlikely to exceed the 1954 ratio to domestic production. As a deficit area, the West Coast was exempted from these voluntary limitations. In this connection, the Under Secretary of State of the United States, in an address to the Interstate Oil Compact Commission in June, 1956, said:

"... The [Cabinet] Committee recognized the desirability of placing in a separate category crude oil imports from Canada and Venezuela ... national defense was one of the basic factors affecting this decision. In the event of a national emergency, oil from Western Hemisphere countries will always be recognized as our safest supplemental source of petroleum. Moreover, in the case of Canada, the United States had encouraged the building of the Trans Mountain Pipeline .... Also in the case of Canada an additional factor underlying the Committee's conclusion was the fact that most of Canada's crude oil exports to the United States come to areas where they are needed to supplement domestic sources and where the detrimental effects on the domestic industry are at a minimum. The light Canadian crudes are especially needed on the West Coast ..."

In August, 1956, however, as a result of a sharp rise in projected imports, the Independent Petroleum Association of America and others petitioned the United States Government for immediate limitations on oil imports as provided for by the Trade Agreements Extension Act. Projected imports for the second half of the year, it appeared, would exceed the recommended 1954 import-production ratio of 10.34 per cent by approximately 500,000 barrels daily. Of this excess, some 440,000 barrels fell within the "exempt" categories - 270,000 barrels on the West Coast from all sources, including Canada, and 170,000 barrels from Canada and Venezuela into the rest of the United States. The remaining 60,000 "non-exempt" barrels were to be imported by new, rather than established, importers. It was the increasing number of importers, as well as the rising volume of imports, which appeared to aggravate the problem.

The Suez crisis in November, 1956, led to the postponement of

any immediate action but, in April, 1957, on the basis of new import schedule filings, the Director of the Office of Defense Mobilization found that, under the terms of the relevant legislation, the national security was threatened. In July, 1957, a Special Cabinet Committee issued its recommendations for a voluntary import programme. Crude oil imports into Districts I-IV, i.e., the area east of the Rocky Mountains, were to be limited to approximately 12 per cent of domestic production. Established importers were requested to reduce their imports by an amount equivalent to 10 per cent of their average crude oil imports for the years 1954-56. New importers, i.e., those who had not imported more than 20,000 barrels daily in 1954, were to be permitted to import their scheduled amounts, but in no case in excess of their actual 1956 imports, plus 12,000 barrels daily. The preferential position of Canadian and Venezuelan crudes, which had been established in August, 1955 under the procedure of the Office of Defense Mobilization, was not continued. In effect, each company was permitted, within the limits of its quota, to select its own sources of foreign supply.

The only refineries within Districts I-IV which had been taking Canadian crude were those on the western edge of the Great Lakes area. The immediate effect of the new import programme on exports of Canadian crude to these refineries appears to have been negligible, as they fell under the "new importer" classification.

Table XV shows Canadian exports to the Middle West in 1954-56 and the quota existing in 1957. Two small refineries in Michigan not shown in this table have also been customers for Canadian crude oil. Up to the end of February, 1958, Canada was the only source of imports of foreign crude oil into the Middle West area.



TABLE XV  
EXPORTS OF CANADIAN CRUDE  
TO THE MIDDLE WEST AREA OF THE UNITED STATES, 1954-1956  
AND IMPORT QUOTAS, 1957  
(in thousands of barrels daily)

	1954	1955	1956	Programmed imports last half of 1957	Allowable imports per formula
Great Northern Oil	-	6.0	21.1	33.0	33.0
International Refineries	2.0	2.0	9.2	10.9	10.9
Lakehead Pipe Line	-	-	0.3	0.3	0.3
Lake Superior Refining	2.0	2.0	5.0	5.0	5.0
Northwestern Refining	-	2.0	6.0	10.0	10.0
Shell Oil	-	0.5	0.8	7.5	7.5
Total	4.0	12.5	42.4	66.7	66.7

Source: Compiled by Commission staff from data published by the United States Department of the Interior.

Table XVI shows that Canadian exports to the Middle West area failed to reach the assigned quotas. During 1958 several refining companies in the Middle West area cut back their use of Canadian crude and their import quotas were being used on an exchange basis to import Venezuelan crude for the use of other refineries. In effect, therefore, Canadian crude indirectly lost a portion of the Lakehead market to crude oil from Venezuela.

TABLE XVI  
IMPORTS AND QUOTAS IN THE MIDDLE WEST AREA  
OF THE UNITED STATES, 1957-1959  
(in thousands of barrels daily)

	Total Import Quotas (a)	Imports from Canada	Imports from other foreign countries (b)
<u>1957</u>			
July	66.7 <sup>(c)</sup>	55.4	-
August	66.7	50.1	-
September	66.7	43.9	-
October	75.1	50.5	-
November	75.1	51.2	-
December	75.1	66.2	-
<u>1958</u>			
January	75.1	73.7	-
February	75.1	70.9	-
March	75.1	67.9	13.9
April	68.3	43.9	15.8
May	68.3	49.9	18.9
June	67.9	61.6	14.4
July	66.1	55.6	4.0
August	64.9	59.1	4.0
September	64.1	56.5	4.0
October	64.1	42.7	10.7
November	64.1	58.5	11.4
December	64.1	56.3	32.1
Monthly average		58.0	12.9
<u>1959</u>			
January	64.1	63.7	8.0
February	64.1	60.1	9.0
March 1-10 <sup>(d)</sup>	64.1	60.7	4.0
March 11-31 <sup>(e)</sup>	67.5	59.6	-

(a) Figures are sums of quotas, as of the first of the month, assigned to refineries considered to be customers for Canadian crude.

(b) No foreign crude oil, other than Canadian crude oil, actually was imported into the Middle West. "Imports from other foreign countries" represent amounts imported into East Coast areas of the United States by refiners operating in northern areas of the Middle West.

(c) Quotas were made retroactive to July 1, 1957, although the programme was not implemented until July 29, 1957.

(d) End of Voluntary Oil Import Programme.

(e) Beginning of Mandatory System.

Source: Compiled by Commission staff from data supplied by the United States Department of the Interior.

In December, 1957, the Special Cabinet Committee of the United States Government reviewed the supply-demand balance on the United States West Coast, known as District V. During the six months following its earlier report, demand in District V had lessened significantly, reflecting the effects of general economic factors and the impact of increased natural gas sales in that District. Moreover, a new pipe line, from the Aneth field of Utah in the "Four Corners area" to the Los Angeles area, was scheduled to begin the shipment of crude oil into California early in 1958 at a rate of 70,000 barrels per day. This line was intended to increase the availability of domestic oil to California. At the same time, importing companies were projecting a substantially increased volume of imports of foreign crudes for subsequent months. The Committee, therefore, recommended that, effective for the first six months of 1958, the programme of voluntary import restrictions should be extended to District V, with crude oil imports being limited to 220,000 barrels daily. This involved a reduction of some 130,000 barrels per day below the scheduled volume. Major importers, i.e., companies which averaged more than 3,000 barrels of imports per day during 1956-57, were requested to reduce imports to a level 15 per cent below their 1956-57 daily average. All companies at that time importing Canadian crude oil fell within this category. Table XVII shows the crude oil quotas thus established, for the first half of 1958, for companies in District V having refining operations in the Puget Sound area.

TABLE XVII  
CRUDE OIL QUOTAS ESTABLISHED FOR COMPANIES IN DISTRICT V  
HAVING REFINING OPERATIONS IN THE PUGET SOUND AREA  
(thousands of barrels per day)

Importer	Average imports 1956-57	Scheduled imports first half of 1958	Import quota assigned for first half of 1958
General Petroleum Corporation	30.0	27.4	25.5
The Texas Company	24.2	28.5	20.6
Shell Oil Company	<u>38.2</u>	<u>35.0</u>	<u>32.5</u>
Total	92.4	90.9	78.6

Source: Compiled by Commission staff from data published by the United States Department of the Interior.

Crude oil imported into District V by the companies shown in Table XVII, during the first half of 1958, did not fall significantly below the quotas set for these companies. However, as indicated by Table XI, Canadian exports to the Puget Sound area dropped very substantially during 1958. Canada exported to the area a peak average of approximately 94,000 barrels per day in July, 1957, but only some 52,000 barrels per day in January, 1958. By the autumn of 1958 these exports had declined to little more than an average of 11,000 barrels per day. The continued export of even this small volume was the result of a special arrangement whereby Imperial Oil Limited accepted at Montreal or Halifax 11,500 barrels per day of Venezuelan



crude owned by an affiliate of General Petroleum Corporation and the latter Company took crude oil from Western Canada at its Puget Sound refinery. Late in 1958 this arrangement was supplemented by an additional 12,000 barrels per day taken by General Petroleum Corporation for its Puget Sound refinery on a similar exchange basis.

The Shell refinery at Anacortes substituted higher-cost California crude, early in 1958, for the greater part of its Canadian imports. The Company had an inventory surplus of crude and products in the San Francisco and Los Angeles areas. In addition, there were long established relationships with local producers of crude. Rather than shut back the modern refinery at Anacortes and run this crude in California, it was decided to ship the crude north and operate the Anacortes refinery at capacity. The Company also had access to crude oil in British Borneo which could be laid down at competitive prices in the Puget Sound area. Consequently, Shell decided to discontinue its use of Canadian crude at Anacortes throughout the second half of 1958, although in May, 1958, Shell Oil Company of Canada had predicted to the Commission a doubling of the then 10,000 barrels a day receipts of Canadian crude by this refinery for the following month and further increases later.

The Texas Company's Puget Sound refinery at Ferndale commenced operations during the last quarter of 1958. In its testimony before the Commission, McColl-Frontenac Oil Company Limited (now Texaco Canada Limited) reported that it had been informed by its parent company, i.e. The Texas Company, that the new Ferndale refinery was expected to take some 8,000 barrels per day of Canadian crude, amounting to 20 per cent

of its capacity. However, as at May, 1959, the Company had used no Canadian crude in its Ferndale refinery, in spite of the fact that its Canadian subsidiary, Texaco Exploration Company, has sizeable oil reserves in Western Canada.

In a "Memorandum for the President" dated February 27, 1959, the Office of Civil and Defense Mobilization advised that the quantities of oil imports and conditions in the industry had not been stabilized and that:

"in the current world over-supply situation, excessive quantities of low-priced oils from offshore sources are seeking a United States market. In such a situation, without control of production in relation to demand by the countries of origin, it is to be expected that there would be substantial economic incentives to increase imports into the United States. The consequences would continue to upset a reasonable balance between imports and domestic production, with deleterious effect upon adequate exploration and the development of additional reserves which can only be generated by a healthy domestic production industry".

In its Report to the President, dated March 6, 1959, the Special Committee to Investigate Crude Oil Imports found that, although the majority of firms in the oil industry had complied with the Voluntary Programme, certain factors compelled mandatory action. These included:

"the excessive imports by companies who had not complied with the Voluntary Programme; a threat to the success of the Voluntary Programme because of increased importation of unfinished oils and products; the likelihood of increased non-compliance among companies now having allocations when they are asked to cut back imports voluntarily in order to provide allocations for newcomers to the Programme; and the impossibility of working out a desirable and legally permissible revision of the Voluntary Programme acceptable to the Committee which will take care of these requirements".

On March 10, 1959, a Proclamation was issued by the President of the United States establishing a system of mandatory controls, effective March 11, 1959, to replace the voluntary control programme. The basis of the mandatory system, like that of the voluntary programme, was described as

"the certified requirements of our national security which make it necessary that we preserve to the greatest extent possible a vigorous, healthy petroleum industry in the United States".

In announcing the introduction of the new system, the President stated:

"The United States recognizes, of course, that within the larger sphere of free world security, we, in common with Canada and with the other American Republics, have a joint interest in hemisphere defense. Informal conversations with Canada and Venezuela looking toward a coordinated approach to the problem of oil as it relates to this matter of common concern have already begun. The United States is hopeful that in the course of future conversations agreement can be reached which will take fully into account the interests of all oil producing states".

Under the mandatory system import licences were to be granted for periods of six months, except that the initial licences were to be issued for the period ending June 30, 1959.

The total quota for refineries in the United States which had been using Canadian crude oil was lowered, as is shown in Table XVIII, from the previous quota. This decrease came about largely as a result of a reduction in District V. The net change in Districts I - IV was not appreciable.

Table XVIII sets out the new quotas established under the mandatory control system for refineries in Districts I - IV and District V which had used Canadian crude and compares them with those in force immediately prior to the introduction of mandatory controls. It will be noted that two small refiners - Leonard Refineries, Inc., and West Branch Refineries, Inc., both in Michigan, were authorized as "new importers".

TABLE XVIII  
CRUDE OIL QUOTAS ESTABLISHED IN MARCH, 1959,  
UNDER THE UNITED STATES MANDATORY CONTROL SYSTEM  
FOR COMPANIES WHICH HAD USED CANADIAN CRUDE OIL

Company	New Quota bbl/day	Old Quota bbl/day
<u>District I - IV</u>		
Bay Refining Co.	2,160	2,700
Great Northern Oil Co.	22,480	28,100
International Refineries, Inc.	8,400	10,500
Northwestern Refining Co.	9,200	11,500
Murphy Corporation (a)	3,440	4,500
Leonard Refineries	2,710	-
West Branch Refineries, Inc.	200	-
Shell Oil Company and other quota allocations	<u>18,910</u>	<u>6,800</u>
Sub-total	<u>67,500</u>	<u>64,100</u>
<u>District V</u>		
General Petroleum Corp.	19,120	23,900
Shell Oil Company	24,320	30,400
The Texas Company	<u>15,440</u>	<u>19,300</u>
Sub-total	<u>58,880</u>	<u>73,600</u>
Total	<u>126,380</u>	<u>137,700</u>

(a) Successor to Lake Superior Refining Company

Source: Compiled by Commission staff from information supplied by the United States Department of the Interior.

As a result of the reduction made for District V, General Petroleum's quota was reduced from 23,900 to 19,120 barrels per day and, because this was the only company in District V taking Canadian crude, exports of Canadian crude to this District were thereby reduced correspondingly. A total of 39,760 barrels per day was available under the new quota for Shell Oil Company and The Texas Company. These companies did not use their quotas to acquire any Canadian crude but continued to import overseas crude. However, in April, 1959, immediately prior to the



exemption of Canadian oil from the mandatory import restrictions, Shell Oil Company nominated for 12,000 barrels per day of Canadian crude for use in its Anacortes refinery in May, 1959.

In the St. Paul area the Great Northern Refining Company, which had been taking its full import quota in Canadian crude, had its quota reduced under the mandatory import restrictions from 28,100 to 22,480 barrels per day. Other refiners in the Middle West area which used Canadian crude had been operating below their quotas and were not directly affected by the relatively small decrease made in them.

Thus, during the period July, 1957 to May, 1959, when Canadian crude exports to the United States were subject initially to voluntary import controls and subsequently, for a short period, to mandatory controls, exports from Canada to the Pacific Coast states decreased from approximately 100,000 barrels per day to a volume at the end of 1958 of little more than one-tenth of this figure, while exports to the Middle West area failed to record any significant growth. By the end of April, 1959, when the exemption of Canadian crude from mandatory controls was announced, total Canadian exports of crude oil were no higher than the level which had been reached in late 1955, before the Suez crisis threatened. While a part of the decline was attributable to the disappearance of the abnormal situation created by the closure of the Suez Canal, the major Canadian oil companies appearing before the Commission made it clear that, in their opinion, the export of Canadian oil to the United States had been adversely affected by United States import controls. According to a study given to the Commission by one of these companies, experience in the Puget Sound area demonstrated that under the system of voluntary quotas, markets for Canadian crudes were lost to Venezuelan crudes, in spite of the fact that Canadian crudes were more than competitive on a posted price basis with these sea-borne crudes. The restrictions on United States imports would appear to have accentuated the concern of the United States

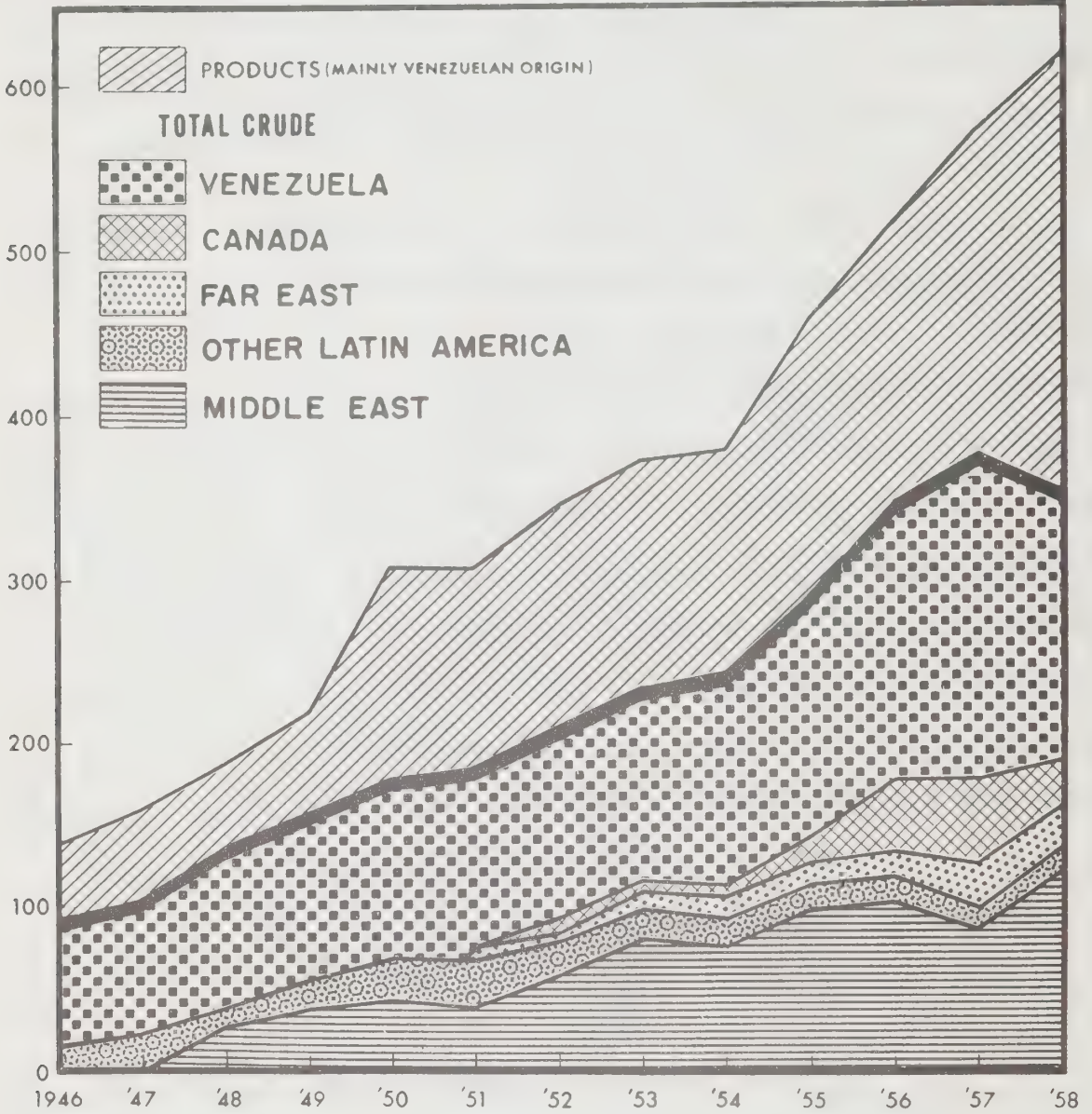
refining companies and their international affiliates to import overseas rather than Canadian crudes in order to secure the greater overall return derived from the use of wholly-owned overseas crudes. There is no doubt that the mandatory controls would have made the export of Canadian crude to the Puget Sound area even more difficult. However, mandatory controls only affected Canadian crude for several weeks.

By a Presidential Proclamation of April 30, 1959, the system of mandatory controls, which had become effective on March 11, 1959, was modified to exempt from quotas, effective June 1, 1959, crude oils, unfinished oils and finished petroleum products entering the United States by pipe line, motor carrier or rail from the country of production. Thus these exemptions were limited to Canada and Mexico, the only two countries which can comply with the requirements for exemption. Tanker shipments are not exempt and ocean shipments from British Columbia to California, such as those made during 1956 and 1957, are still subject to the import quota system. The great bulk of exports from Canada has been by pipe line and it is those exports which are now fully exempted from any quotas. In Chapter 4 we endeavour to assess the significance of the exemption of Canadian crude from United States import controls on the future prospects of exports of such crude to United States markets.

Chart 7, "United States Oil Imports 1946-1958" illustrates the growth in oil imports into the United States since 1946, and shows the prominent role of Venezuela in both crude oil and product supply, the increasing shipments from the Middle East and the relatively small volume of Canadian crude oil reaching United States markets.

# UNITED STATES OIL IMPORTS 1946-1958

MILLION Bbl



SOURCE: PETROLEUM PRESS SERVICE



Some Factors in the World Oil Industry Affecting  
the Export of Canadian Crude Oil

The broader significance of the United States import restrictions is apparent when these restrictions are related to changes in basic conditions of the world oil industry which have occurred in recent years. A world surplus of oil of major proportions had developed by 1958, which gave rise to an intensification of United States import restrictions and resulted in a weakening of petroleum prices. In addition, world shipping conditions had altered and tanker rates had declined.

The surplus of petroleum in the world arose, in large part, from the discovery and development of vast new reserves. In Venezuela, crude oil and natural gas liquid reserves increased from 7.3 billion to 16 billion barrels during the decade after 1947. During the same period, Venezuelan production rose from 435 million to 1,027 million barrels per year. The fact that Venezuelan oil fields are close to tidewater and ocean transportation gives the country a strong competitive position in the world oil trade. Middle East reserves in 1947 stood at 19.6 billion barrels and constituted about 37 per cent of the total world reserves (excluding the U.S.S.R. and associated countries) at that time. By 1957 reserves had risen to 169.5 billion barrels or 70 per cent of total world reserves. During the period 1947-57, Middle East production increased from 310 million to 1,290 million barrels per year giving the Middle East, in 1957, one-fifth of the world's markets. Moreover, sufficient reserves had been discovered so that this level of production could be maintained for well over a century without further exploration. As in the case



of Venezuela, oil in the Middle East has ready access to tidewater, which gives this region a particularly strong competitive position when tanker rates are low.

Table XIX summarizes the relative growth in reserves and production in the United States, Venezuela, the Middle East and other countries during the period 1947-57.

TABLE XIX

WORLD RESERVES AND PRODUCTION OF OIL AND NATURAL GAS LIQUIDS

(excluding the U.S.S.R. and associated countries)

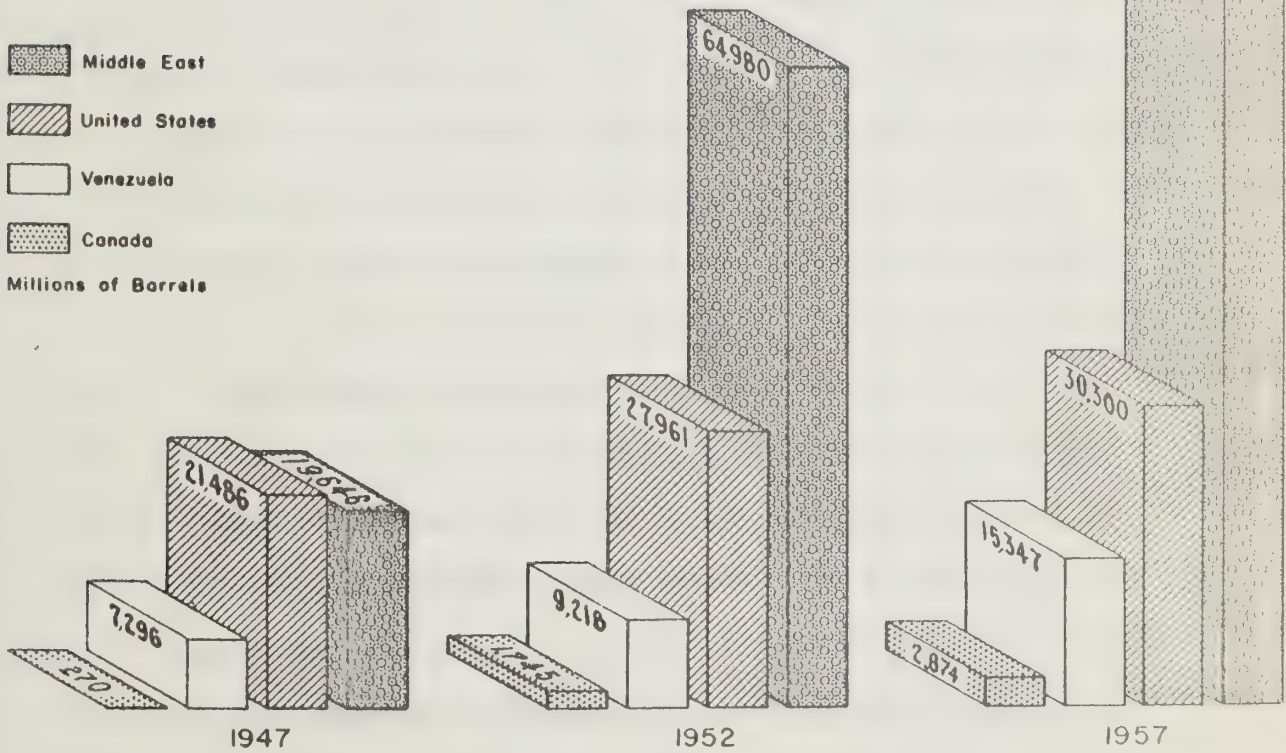
(in billions of barrels)

	<u>Reserves</u>		<u>Production</u>	
	<u>1947</u>	<u>1957</u>	<u>1947</u>	<u>1957</u>
U.S.A.	24.7	36.0	1.99	2.91
Venezuela	7.3	16.0	0.43	1.03
Middle East	19.6	169.5	0.31	1.29
Other Countries	1.9	19.1	0.06	0.79
Total	53.5	240.6	2.79	6.02

Source: Compiled by Commission staff from various official sources.

Chart 8, "Petroleum Reserves, Selected Countries, 1947-1952-1957", further illustrates the growth of crude oil reserves, exclusive of natural gas liquids, in the principal oil producing areas of the world.

PETROLEUM RESERVES SELECTED COUNTRIES  
1947 -1952 -1957



PREPARED BY COMMISSION STAFF

A study by World Oil in August, 1955, showed that United States companies controlled 57 per cent of all oil reserves outside of the United States, exclusive of those in the U.S.S.R. and associated countries. A Chase Manhattan Bank study indicates the extent of United States oil companies' participation in the oil industry in foreign countries, in terms of investment in gross fixed assets, as at December 31, 1957:

Canada	57 per cent
Venezuela	64 per cent
Western Europe and Africa	22 per cent
Middle East	47 per cent
Far East	33 per cent
Other countries and foreign flag tankers	19 per cent

These companies produced 56 per cent of the total output of crude oil in these countries in 1957. Their participation in Middle East production was 58 per cent and in Venezuela was 64 per cent.

The dominant position in the world oil industry, exercised by United States companies, is held by five companies, namely: Standard Oil Company of New Jersey, Gulf Oil Company, Socony Mobil Oil Company, The Texas Company and Standard Oil Company of California. It has been estimated that these five companies in 1956 accounted for 54 per cent of all oil production outside of the United States. In a recent Fordham University study it is indicated that Standard Oil of New Jersey and Gulf Oil derive two-thirds of their net income from foreign operations and Standard Oil of California, one-half. The vital interest that these five international companies, which account directly for about one-half of all the United States oil imports and indirectly for additional amounts, have in foreign oil operations is

indicated by the fact that each of them has at least 90 per cent of its reserves located in foreign countries. The companies have foreign oil reserves equivalent to about three times the total proved reserves of the United States. At the same time these five companies, together with the British Petroleum and Royal Dutch-Shell Groups, account for about 85 per cent of the world's oil production outside of the United States and the U.S.S.R. and associated countries. The United States oil industry is thus heavily involved throughout the world.

In spite of the dominant role played by the five companies referred to with respect to the reserves of oil located in foreign countries, these companies own less than one-third of the reserves of oil located within the United States. The larger portion, at least two-thirds of these reserves in the United States, is owned by numerous other United States oil companies. These five companies are dominant, however, in the refinery sector of the industry in the United States.

Owing to the development of a world oil surplus United States companies have encountered increasing difficulties in holding and expanding the markets for oil produced from their overseas holdings. Their efforts to use oil from these sources in their own or affiliated refineries in the United States have therefore tended to increase. On the other hand, the use of Canadian oil owned by these refining companies tends to be less attractive financially since, under the prorationing of production applied in Alberta, for example, United States refiners using Canadian crude are required to purchase oil produced by other companies as well as from their own holdings. For this reason, their purchases in Canada may well benefit their competitors more than themselves, which is not true of their purchases from overseas. In some instances the percentage of company "owned" crude would be



relatively small as compared with the total amount of crude purchased by the company in Canada. This would be so if the purchasing company's oil reserves in Canada, and the corresponding prorated share in production, were small.

This situation may be contrasted with that of a company importing "owned" crude from a concession area in Venezuela, the Middle East or the Far East. Under the "concession" system of ownership practised overseas, the systems of multiple land ownership in oil areas and prorating used in North America are virtually non-existent, so that a United States refining company is able to import and refine crude oil obtained exclusively from its own or affiliated properties. By so doing it is able to earn profits from its production as well as from its refinery operations. Under such circumstances, it might prove more profitable, for the production and refining operation as a whole, to import and use company-owned crude in its United States refinery even if the per barrel cost were somewhat higher than that of crude obtained from an alternate North American source. The ability of United States oil companies to realize such profits on production, when using their own overseas crudes in United States refining operations, explains, in part, the difficulty which Canadian crude has had in gaining a larger share of the Pacific Northwest market despite the fact that Canadian crude has been competitive with the posted prices of offshore crudes.

Where replacement costs overseas are low and proved reserves are sufficient to support production over many decades in the future without further exploration, as in the Middle East, the use of "owned" crude from such sources also means that the revenues obtained from production can be considered as freely available, in the sense that the producing company does not need to use any appreciable part of them to replace its reserves. By contrast, in Canada, the reserves are not

sufficient to avoid the necessity of re-investing a large part of the revenues obtained from production if the company desires to replace the oil which is produced and thereby maintain its position in the industry. In addition, replacement costs in Canada are high relative to revenues from production. It should be mentioned that the force of these various incentives to use "owned" crude, rather than Canadian crude, can be expected to vary from time to time reflecting, inter alia, the stability of international affairs and political conditions within the different oil producing countries overseas.

The weakness of product prices in the United States during 1957 and early 1958, with resultant adverse effects on refinery margins, appears also to have been a factor in the large number of applications for quotas by independent refining companies which had not previously imported crudes. There is little doubt that the greater intensity of competition in domestic and overseas markets over the last year or more has increased the desire of refining companies to take advantage of low tanker rates and to use overseas "owned" crude wherever possible, even though crudes could have been purchased somewhat more cheaply from Canadian sources on the basis of posted prices.

The behaviour of ocean tanker rates since the Suez crisis has contributed to the difficulties of marketing Canadian crude in the Puget Sound area. Tanker rates in general have been reduced during this period as a result of several factors. The greatest influence has been the increase in the tanker tonnage available, stimulated in part by the efforts made at the time to overcome the scarcity created by the closing of the Suez Canal and the resultant necessity of sending tankers over the longer sea routes to the Middle East. Many tankers, which had formerly been laid up, were brought back into service during the Suez crisis and the construction of new

tankers was accelerated. A further increase in tanker tonnage developed as new "super tankers" designed for low cost transportation of oil became available.

The result of these developments has been that ocean tanker rates have fallen appreciably since the period 1956-57, when Canadian crude was expanding its sales into the Puget Sound area. Spot tanker rates, which had been as high as USMC plus 200 per cent or more in late 1956 and early 1957 in the Western Hemisphere, fell to a level as low as USMC minus 50 per cent or less in early 1958. The vast majority of tanker shipments to the North American refineries, of course, were not affected by price fluctuations of this range. The shipment of overseas oils to these refineries is covered, in the main, by long-term tanker contracts. Nevertheless, the period of low or "distress" rates in spot charters, which began to develop in the latter part of 1957, has had a marked effect in reducing tanker rates in general.

Since the latter part of 1957 Canadian exports of oil, particularly to the Puget Sound area, have felt the impact of all these adverse factors operating in the world oil economy. It is difficult to determine how long each of them can be expected to persist. Some of these factors seem to be inherent in the structure of the world oil economy while others may be of a temporary nature. It is clear, however, that full account must be taken of these changing factors, as well as of changes in import regulations, in any assessment of future exports of Canadian crude oil to the United States.

## CHAPTER 4

### FUTURE MARKETS FOR CANADIAN OIL

Markets for Canadian oil are likely to be confined to Canada and to the United States. While Canada has large reserves of crude oil they are not located near tidewater but are "landlocked" in Western Canada. This crude must move long distances overland in order to reach large and growing markets. Costs of exploration, development and production of crude oil in Canada are, on the average, higher than in Venezuela and the Middle East. The combination of these circumstances puts Canadian crude at a disadvantage in world markets and limits possible export markets to the United States.

#### United States Markets

##### Supply and Demand in the United States

The United States is the largest consumer of petroleum products in the world, both in absolute and per capita terms, and this situation may be expected to continue for some time. The Chase Manhattan Bank, among other authorities, has estimated the growth of consumption of petroleum products to be anticipated from an expected increase in population of approximately 30 million in the next 10 years. Estimates have also been made by various authorities as to the capacity of the industry in the United States to meet this greatly increased demand. Some of these demand and supply estimates are shown in Table XX.



TABLE XX

ESTIMATES OF PETROLEUM DEMAND AND POTENTIAL DOMESTIC PRODUCTIONIN THE UNITED STATES - 1957 and 1967

(in thousands of barrels daily)

	<u>1957</u>	<u>1967</u>
<u>Total petroleum demand</u>		
The Chase Manhattan Bank <sup>(a)</sup>		
Total United States	8,817	14,400
<u>Potential petroleum production</u>		
The Chase Manhattan Bank <sup>(a)</sup>		
Crude oil	8,500	9,500
Natural gas liquids (Actual production)	<u>807</u>	<u>1,300</u>
Total	9,307	10,800
Warren B. Davis, Gulf Oil Corp. <sup>(b)</sup>		
Crude oil		9,000
National Petroleum Council, U.S.A. <sup>(c)</sup>		
Crude oil	9,867	
Independent Petroleum Association of America <sup>(d)</sup>		
Crude oil	9,250	
Natural gas liquids	<u>850</u>	
Total	10,100	
Resources For The Future, Inc. <sup>(e)</sup>		
Crude oil		13,700

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- (a) The Chase Manhattan Bank, "Future Growth of the World Petroleum Industry", New York, November, 1958.
- (b) Warren B. Davis, Gulf Oil Corporation, "The Long-Range Crude Oil Productive Capacity of the United States", a Society of Petroleum Engineers of A.I.M.E. paper, February, 1958.
- (c) This estimate published by the National Petroleum Council Committee on Petroleum Productive Capacity in October, 1957, applies to January 1, 1957.
- (d) Independent Petroleum Association of America, Committees on Supply and Demand and Productive Capacity. This estimate applies to the year-end.
- (e) Based on estimates by Bruce C. Netschert "The Future Supply of Oil and Gas", Resources For The Future, Inc., Washington, D.C., January, 1958.

The Chase Manhattan Bank estimate of petroleum demand in 1967 is based on a 5 per cent annual increase during the period 1957-67. Another authority has expressed the view that demand is more likely to increase at the lower rate of 3 per cent annually.\* The significance of the different assumptions is indicated by the fact that the lower rate of increase would result in a requirement of some 11,815,000 barrels per day in 1967, in contrast to the requirement of 14,400,000 barrels per day shown in the table.

It is generally conceded that, difficult as it may be to estimate potential demand in 1967, it is just as difficult to estimate potential supply. There are even differences of opinion regarding the present potential capacity of the industry in the United States. It will be seen from Table XX that estimates of crude oil producibility in the United States at the end of 1957 ranged from 8.5 million to approximately 10 million barrels per day. Inasmuch as the actual domestic production of crude oil in 1957 averaged some 7.2 million barrels per day, The Chase Manhattan Bank estimate would indicate a total surplus capacity of about 1.3 million barrels per day for that year, whereas the other estimates would indicate a surplus capacity for crude oil of 2 to 3 million barrels per day.

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\* "This estimate of new crude oil necessary for the next decade is considerably less than some recent forecasts which assume a 5 per cent annual rate of increase in demand and that discoveries must be one and one-half times production. The estimate of The Chase Manhattan Bank that 57 billion barrels of additional domestic crude oil would be necessary, if domestic production is to continue to supply 90 per cent of the nation's oil needs, will probably prove to be incorrect for two reasons. First, demand is more likely to increase at a rate of 3 per cent rather than 5 per cent, for reasons already stated; and second, improvements in reservoir management will permit reserves to be produced more rapidly. These considerations require a rate of additions to oil reserves only slightly higher than that of the past 10 years." ("The Dynamics of Domestic Petroleum Resources" by Morgan J. Davis, President of Humble Oil and Refining Company, an American Petroleum Institute Paper, November, 1958).

The variation in estimates of potential production for the year 1967 is of significance for any appraisal of Canada's possible exports of crude oil to the United States. The National Petroleum Council foresees no difficulty in sustaining the present crude oil producibility, if the present rate of drilling activity of 41,000 to 50,000 wells annually is continued in the United States. The estimate of Resources For The Future, Inc., referred to in Table XX, concluded that "the indicated total domestic availability of crude oil in the United States in 1975, at no appreciable increase in constant dollar costs, is on the order of six billion barrels." On the basis of this estimate, producibility in 1967, as shown in Table XX, could be some 13,700,000 barrels per day. If this level of production were achieved in 1967 it would amount to about 95 per cent of the demand, as estimated by The Chase Manhattan Bank. On the other hand, the Bank estimate of a production of 10,800,000 barrels per day (crude oil and natural gas liquids) in 1967 indicates the extent to which, in the opinion of that institution, the increased requirements for petroleum products will be met from domestic sources in 1967 after taking into account, among other things, the role of continued imports and an assumed rise in replacement costs in the United States. The estimate by Warren B. Davis of about nine million barrels per day as the "producing rate" in 1967 assumes a drilling success rate better than that of the past nine years but poorer than that of the past 20 years, a crude oil price rising to \$4.00 per barrel (in 1956 dollars) and a maximum annual producing capacity equivalent to 10 per cent of year-end reserves.

There appears to be disagreement also on the important question of cost trends. Certain projections of recent experience in finding and developing new oil reserves in the United States have suggested that costs are likely to rise. For example, a cost study by H.J. Struth, a United

States petroleum consultant, indicates that current dollar costs of finding oil in the United States are continually rising and shows an average discovery cost, on a three-year moving average basis, for the years 1954-56 of 98 cents per barrel, compared with 51 cents per barrel for the years 1950-52 and 32 cents per barrel for the years 1945-47.\* The study concludes that in the past ten years there has been a substantial increase in discovery costs and a narrowing of the differential between costs and market prices. Other authorities consider that improved technology, the increasing part to be played by natural gas and natural gas liquids in meeting the costs of discovery, together with an improvement in conservation procedures, will offset any tendency towards higher costs. The preponderance of opinion, however, seems to be that this tendency towards higher costs will continue.

The estimates in Table XX suggest that the domestic supply-demand position of the United States in 1967, in respect of crude oil and natural gas liquids, could range from one approaching self-sufficiency to one requiring the importation of some 25 per cent of the country's petroleum requirements. Total oil imports in 1967 could, therefore, be relatively minor or could be as high as four million barrels per day,\*\* compared with the importation in 1958 of some 1.6 million barrels per day.

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\* H.J. Struth, "Oil Finding Costs Hit New Peak", The Petroleum Engineer, January, 1959, p. B-27.

\*\* In a paper entitled "World Oil Trade and International Payments", presented at the Fifth World Petroleum Congress, New York, June, 1959, by Bernard T. Stott, United States oil imports by 1967 are forecast in the range of three to four million barrels a day.



Imports of crude oil (exclusive of products) into the United States over the past five years have been as follows:

1954 - 656,000 barrels per day	1957 - 942,000 barrels per day
1955 - 782,000 " " "	1958 - 961,000 " " "
1956 - 934,000 " " "	

There is the further factor of the future import policy of the United States. If the system of mandatory import restrictions is continued, the growth in crude oil imports generally into the United States may be at a slower rate than that experienced during the past five years. In view of the many uncertain factors and the wide divergence of opinions that have been expressed, the Commission has not attempted to estimate United States requirements for crude oil imports. It seems reasonable to conclude, however, that even under existing import controls there is likely to be an increase in total crude oil imports over the next 10-year period.

While the prospects for the export of Canadian crude to the United States will be affected by the magnitude of the oil deficiency of that country, they will also be influenced by other factors, including the future world supply and demand situation.

#### Future World Oil Supply and Demand

Most estimates of the world oil supply and demand situation suggest that the present surplus producing capacity in the oil industry is likely to persist over the next decade. Table XXI sets out The Chase Manhattan Bank's projection of world supply and demand for the year 1967. This table also gives statistics for the years 1946 and 1957 illustrating, for all countries excluding the U.S.S.R. and associated countries, the

rapid growth in demand and the change in the pattern of supply that has occurred and is forecast for the period up to 1967.

Although this estimate is restricted to a 10-year period, longer term forecasts indicate a continuing high rate of growth in oil demand. A forecast by Walter J. Levy\* for the year 1975 places world oil demand, excluding bunkers, at 37.1 million barrels per day compared with 13.1 million barrels per day in 1956. This increase in demand represents an annual rate of growth of 5.6 per cent. Although the growth of demand for oil in North America during the period 1956-75 is forecast at 3.4 per cent per annum, in contrast to about 5 per cent which may be inferred from Table XXI for the period 1957-67, the daily demand for oil in North America in 1975 would be approximately 15.8 million barrels or almost double the 1956 demand. Thus the general order of growth trends to 1967, indicated in Table XXI, seems to conform to the longer term forecast.

Chart 9, "World Petroleum Supply and Demand", illustrates the growth in the production and consumption of petroleum which took place throughout the world during the period 1946-57. The estimates in Table XXI suggest a similar rate of growth for the next 10 years.

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\* Walter J. Levy and Milton Lipton, "Some Major Determinants of Future Oil Requirements and Supplies", a paper presented to the Fifth World Petroleum Congress, New York, June, 1959.

TABLE XXI

## WORLD SUPPLY AND DEMAND

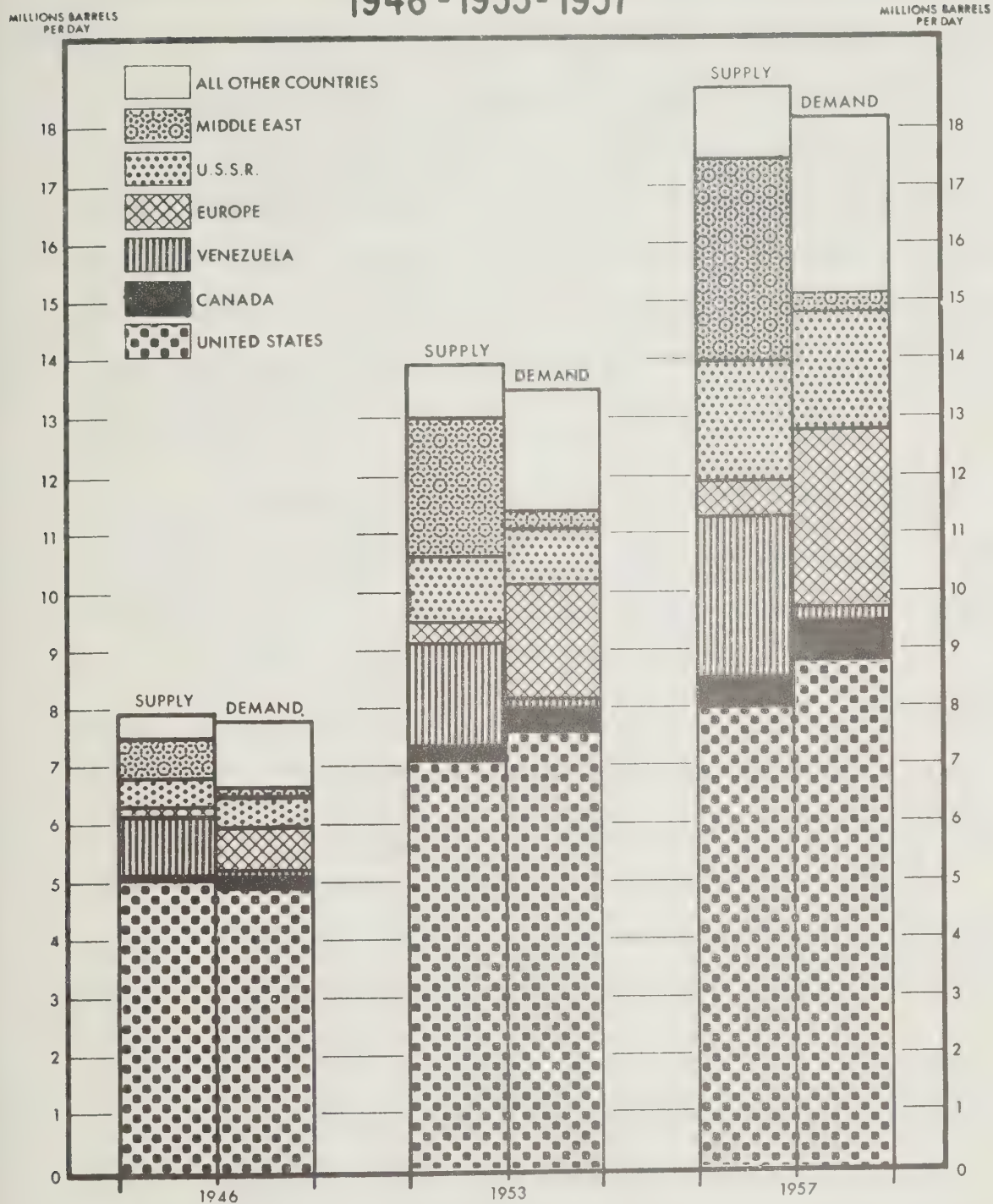
(Excluding the U.S.S.R. and associated countries)

	1946 (in thousands of barrels per day)	1957	1967	1946 (per cent)	1957	1967	Annual growth rate 1957-67 (per cent)
<u>Supply</u>							
Canada	20	497	1,300	0.3	3.0	4.4	10.1
Mexico	135	252	500	1.9	1.5	1.7	7.0
Venezuela	1,065	2,779	5,000	15.3	17.0	17.0	6.1
United States	4,751	7,976	10,300	68.4	48.7	36.6	3.2
Other Western Hemisphere Countries	214	419	1,000	3.1	2.5	3.4	3.1
Total Western Hemisphere	6,185	11,923	18,600	89.0	72.3	53.1	4.3
Middle East	700	3,533	8,650	10.1	21.6	29.3	9.5
Far East	22	465	750	0.3	2.8	2.5	5.0
Other countries	42	286	1,000	0.6	1.3	3.4	13.5
Total Eastern Hemisphere	764	4,284	10,400	11.0	26.2	35.2	9.2
Total Free World	6,949	16,207	29,000	100.0	99.0	95.3	6.0
Other Sources	-	165	500	-	1.0	1.7	11.7
Total	6,949	16,372	29,500	100.0	100.0	100.0	6.0
<u>Demand</u>							
United States	4,912	8,817	14,400	69.3	55.1	48.8	5.0
All other countries	2,179	7,173	15,100	30.7	44.9	51.2	7.7
World	7,091	15,990	29,500	100.0	100.0	100.0	6.3

Source: The Chase Manhattan Bank. (Calculations of percentages by Commission staff).

CHART 9

# WORLD PETROLEUM SUPPLY AND DEMAND 1946 - 1953 - 1957



PREPARED BY COMMISSION STAFF





One of the important features of recent changes in the world pattern of oil supply has been the growth of output in the Middle East and Venezuela. The consensus is that this trend will continue over the next decade. The estimates given in Table XXI indicate that production in the Middle East in 1967 is expected to constitute almost 30 per cent of world production, excluding the U.S.S.R. and associated countries, compared with approximately 22 per cent in 1957. Venezuela's share is expected to remain at approximately 17 per cent of the greatly increased world production. On the other hand, production in the United States is expected to decline from approximately 49 to 37 per cent of world production by 1967.

As indicated in Chapter 3 of this report, the proven oil reserves of the Middle East as now established are sufficient to support the present level of production for more than a century. There can be no doubt as to the capacity of the countries of this area to meet a greatly increased demand. The reserves of Venezuela are also very large. The fact that they are now sufficient to sustain production at the present level for only 16 years is probably explained by the leasing policy of the Venezuelan Government, which did not grant any new concessions during the period from 1943 to 1956. The 16-year supply figure is, therefore, hardly representative of Venezuela's potential oil producing capacity.

The world supply of oil will undoubtedly be greatly augmented by recent discoveries which have occurred in the northern portion of the Continent of Africa.

The oil reserve position in the United States is in sharp contrast to that in the Middle East and in Venezuela. In the United States reserves are sufficient to support production for only about 12 years at the present

rate of output, despite a relatively high level of exploration and development.

The estimates given in Table XXI suggest that the requirements of the United States over the next decade will become a smaller factor in world demand than heretofore. By 1967 the United States demand is estimated to constitute 49 per cent of total world demand compared with 55 per cent in 1957. This change arises from the faster rate of growth in demand anticipated for countries outside the United States. The table illustrates that the growth in demand for oil in the United States is estimated at 64 per cent over the next decade compared with 110 per cent for the rest of the world.

We have already indicated some of the difficulties in assessing the future supply and demand situation in the United States but even greater difficulties are involved in assessing the future world supply and demand situation. The evidence indicates, however, that the world oil supply will be more than sufficient to meet the greatly increased demand which is anticipated. The Chase Manhattan Bank has estimated that, despite the fact that the present producing capacity of the world industry is more than sufficient to meet current requirements, additional investments of \$63 billion will be made in the oil producing areas of the world, outside of the United States, over the next decade, compared with \$26 billion made in the period 1948-57.

The intensity of the competition among oil exporting countries for the United States market is indicated in the Memorandum of the Director of Civil and Defense Mobilization to the President of the

United States, dated February 27, 1959, in which it is concluded that low-priced crude oil and products were being imported from offshore sources in such quantities and under such circumstances as, in his judgment, "to threaten to impair the national security". He stated:

"Finally, it is apparent to me that in the current world over-supply situation, excessive quantities of low-priced oils from off-shore sources are seeking a United States market. In such a situation, without control of production in relation to demand by the countries of origin, it is to be expected that there would be substantial economic incentives to increase imports into the United States.

The consequences would continue to upset a reasonable balance between imports and domestic production, with deleterious effect upon adequate exploration and the development of additional reserves which can only be generated by a healthy domestic production industry.

Accordingly, as a result of my investigation pursuant to Section 8 of the Trade Agreements Extension Act of 1958, I advise you of my determination that crude oil and the principal crude oil derivatives and products are being imported in such quantities and under such circumstances as to threaten to impair the national security."

#### Other Factors

Reference has already been made to the prominent role played by United States oil companies in the development and marketing of world oil resources. In more recent years such activities have been characterized also by the participation of an increasing number of new companies, in contrast to the earlier situation when exploration and development in the concession countries were carried out almost exclusively by a relatively small number of international oil companies. In 1957, 190 United States companies were engaged in oil exploration and development in 91 different countries; at the end of World War II only 28 United States companies were so engaged in 78 different countries.



This greatly increased participation by United States companies in overseas oil regions has not only led to an increased productive capacity in these areas but, as noted earlier, affects the selection of the foreign crudes imported. We have already indicated that, in our opinion, the use by United States refiners of overseas crude oils, owned by themselves or by their affiliates, has been partly responsible for the decline in exports of Canadian crude to the United States. The extent to which this overseas "owned" crude will continue to restrict the export of Canadian crude oil to the United States may well depend, in part, on whether the crudes owned by these companies can be advantageously marketed elsewhere in the world. The intensity of competition for markets may also tend to depress world prices of crude oil in the future, or to prevent them from rising, as the new companies are often less able than the older and larger international companies to forego the revenues that immediate production would bring. Consequently these new companies may find it necessary to reduce prices to secure markets and thereby obtain immediate revenues.

When industry costs are considered, it seems clear that the competition faced by Canadian crude in the United States markets could be intensified by reductions in the selling prices of Middle East or Venezuela crudes. In testimony before a Congressional Committee in 1957, the Independent Petroleum Association of America presented data, based on a 1956 report by the Arabian-American Oil Company, to demonstrate that the total cost of finding, developing and producing Middle East oil does not exceed 30 cents per barrel. Information given to the Commission was to the same effect for the Middle East and also indicated, on a comparable basis, a cost of about 75 cents per barrel for Venezuela crude and somewhat in excess of \$1.00 per barrel for Canadian crude. These cost

figures are before taxes and royalties. The lower finding, development and producing costs of Middle East crude, compared with Canadian crude, arise from the size of the reserves found in relation to the investment and the enormous potential production per well as compared with average Canadian experience.

A cost comparison, however, cannot stop at this point. The large expenditures that are made in the Middle East on projects of a social and general economic nature, in addition to direct expenditures on oil installations, obviously add to the low original cost of the oil itself. Information given to the Commission was that the relative profit margins per barrel of production in the Middle East, Venezuela and Canada, after taxes and royalties, do not differ materially, although there is a very great difference in the relative returns on investment. The significant fact is that in the Middle East the finding costs for the future production of 100 to 150 billion barrels of oil have already been incurred. Consequently, exploration costs for many years may be negligible and Middle East development and production costs in the future will be relatively small because of the high productivity of wells already drilled. Profits from Middle East oil operations may not need to be reinvested in further exploration and development in order to ensure continuity of operations and, therefore, may be available for other investment. On the other hand, in North America, a substantial portion of profits must be reinvested in order to ensure a safe ratio of reserves to production.

Low replacement costs, the desire for a relatively rapid amortization of investment in concession areas and the terms and conditions of concessions, all result in strong pressures to market Middle East crudes. Regardless of whether or not any major price break should take place in the future, the huge reserves of Middle East oil, constituting 70 per cent of the world total, will be highly competitive in world markets.

Tanker freight rates are a large element in the laid down cost of overseas crudes and will continue to influence the competitive

position of Canadian crude oil in United States markets. A recent appraisal by The Oil and Gas Journal\* indicates that the existing surplus of tanker tonnage should increase during the next few years and that tanker rates are likely to remain at low levels. The estimate made of tanker tonnage for the years 1958 to 1961, expressed in numbers of ships of T-2 equivalent,\*\* is set out in the following tabulation:

	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>
Existing fleet less normal obsolescence	2,575	2,525	2,475	2,410
New deliveries (accumulative)	<u>435</u>	<u>795</u>	<u>1,115</u>	<u>1,415</u>
Potential fleet availability	3,010	3,320	3,590	3,825
Tonnage requirements	<u>2,570</u>	<u>2,700</u>	<u>2,935</u>	<u>3,060</u>
Theoretical surplus	440	620	655	765
Per cent surplus	14.6	18.7	18.2	20.0

This tabulation indicates an increase in tanker surplus from almost 15 per cent in 1958 to 20 per cent in 1961. Tanker tonnage requirements are based on a growth of 6 per cent per year in world oil demand, excluding the U.S.S.R. and associated countries. This theoretical surplus might be reduced by less new construction than is now planned and by the obsolescence of the older, smaller tankers. The new ships will be larger, faster and more economical than those now in use. Forecasts of continuing tanker surplus of these proportions give support to the view that charter rates for tankers could remain at their present low levels for at least several years.

On the other hand, some authorities expect tanker rates to increase during the next few years because, they claim, present rates reflect a temporary surplus situation and the rates are not considered sufficiently profitable to support an adequate tanker fleet to meet an

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\* The Oil and Gas Journal, December 29, 1958 - Vol. 56, No. 52, p. 141.

\*\* A T-2 tanker is defined as a bulk petroleum carrier of some 16,765 tons dead weight and having a speed of about 14.5 knots.

anticipated growth in the ocean transportation of oil. Current tanker rates of USMC minus 40 to minus 50 per cent are considered by these authorities to be distress rates. Higher rates, they feel, will be required to ensure the construction and maintenance of a modern efficient fleet of tankers, in spite of the increased efficiency of the modern ships and some reduction in construction costs in recent years.

It should be noted that on the basis of price the competitive position of Canadian crudes in the Puget Sound area would improve relative to Middle East oils by 22 cents a barrel for each increase of 10 percentage points in the USMC rate. Similarly, on the basis of price, the competitive position of Canadian crudes relative to Venezuela oils would improve by 11 cents per barrel.

The factors affecting entry of Canadian crude oil into United States markets do not apply to the same degree in the different sections of that country and it is important to consider them in relation to the specific market areas which have heretofore been supplied, in part, by Canadian crude or which offer prospects for exports from Canada. In examining these particular market areas the Commission took note of the general pattern of regional demand for crude oil in the United States. Expressed in terms of refining capacity, the Gulf Coast accounts for about 33 per cent of total United States crude oil demand. The regions of the Atlantic Coast, Pacific Coast and the major producing states each accounts for approximately 15 per cent of total demand and the inland market, north and east of the major crude oil producing area, accounts for approximately 22 per cent.

#### Particular Market Areas

The Chase Manhattan Bank in 1957 made an estimate of the future demand for petroleum products on the West Coast of the United States. Based on this estimate, total oil demand would rise by 1967



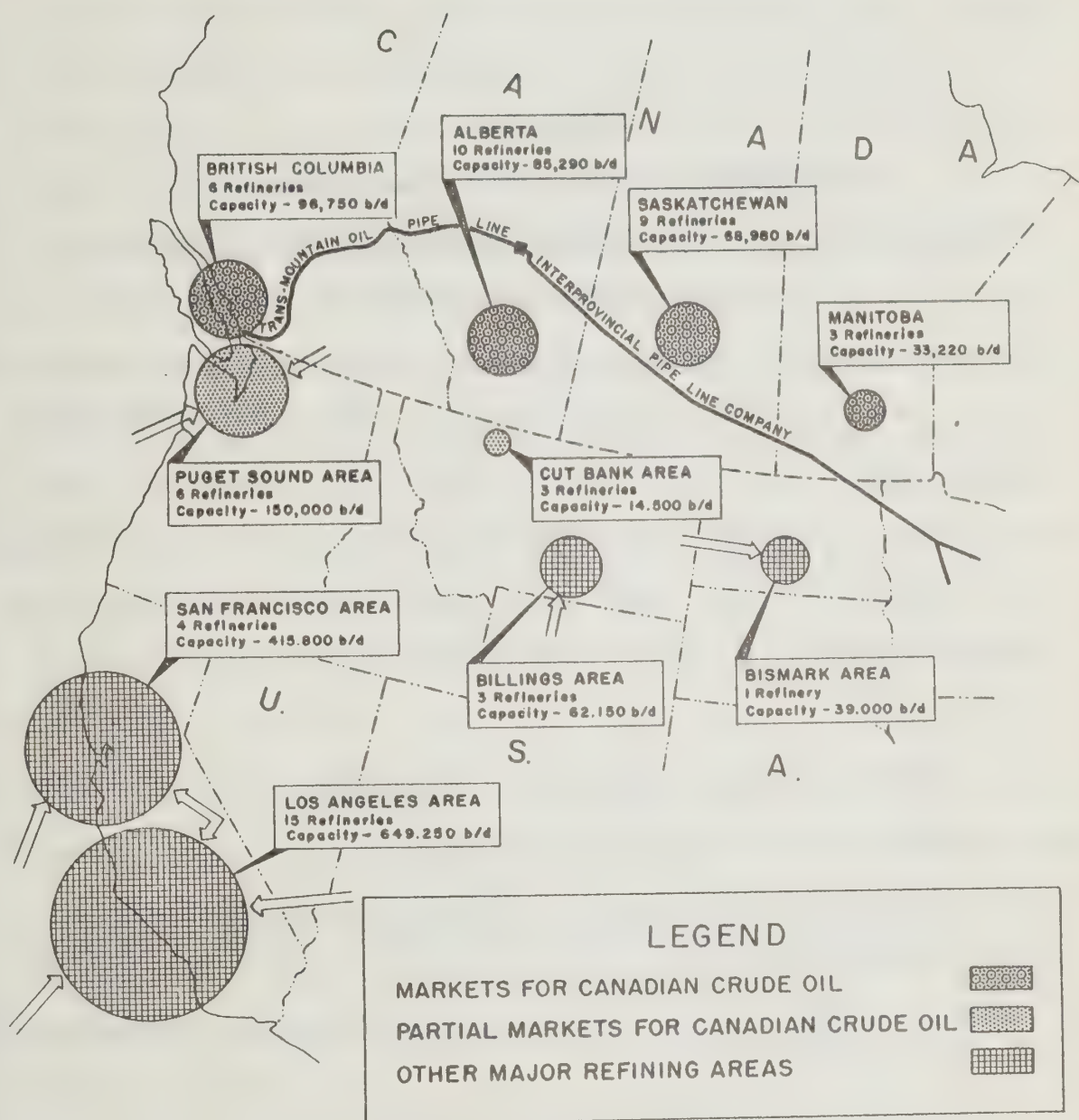
to some 1,900,000 barrels per day, of which approximately one million barrels of crude oil would be supplied by local production and a further 250,000 barrels from other United States sources. The estimate concludes that the balance of some 650,000 barrels will have to be met from imports. In May, 1959, The Oil and Gas Conservation Board of Alberta estimated that the crude oil requirements of District V (Washington, Oregon, California, Nevada and Arizona) would grow from the 1958 level of 1,156,000 barrels per day to 1,524,000 barrels per day in 1965. It also estimated that production of crude oil in District V would remain at 950,000 barrels per day. Consequently by 1965 the difference between demand and production of crude oil would be 574,000 barrels. The Board further concluded that by 1965 refineries in the State of Washington would account for 15 per cent of total District V crude oil demand, or 229,000 barrels per day.

One of the hazards in estimating the future requirements of the West Coast market for crude oil is the difficulty of assessing the extent to which sales of natural gas will affect the demand for petroleum products. Increased exports of natural gas from Canada may, therefore, have an adverse influence on the volume of Canadian crudes which will be exported to the area. A further difficulty in assessing the prospects of this market for Canadian crude is that of determining the extent to which the demand might be met from sources of production in Alaska. In 1958 oil was discovered on the Kenai peninsula and United States oil companies are now actively engaged in the search for oil in Alaska. The preference of the United States for the use of its own domestic crudes would suggest that any major discoveries of oil in this State could seriously affect the prospects of exports of Canadian crude to the West Coast, including the Puget Sound area.

Chart 10, "Principal Petroleum Refining Areas, Western Canada and Western United States, January, 1959", illustrates the importance of this West Coast area as a possible market for crude oil and the favourable geographical position of Canadian crude sources with respect to it.

# PRINCIPAL PETROLEUM REFINING AREAS WESTERN CANADA AND WESTERN UNITED STATES

JANUARY 1959



PREPARED BY COMMISSION STAFF

The relatively short history of refining in the States of Minnesota and Wisconsin makes it difficult to forecast the increase in the requirement for crude oils in this section of the Middle West. Table XXII illustrates the history of Canadian crude exports to this area and contains a short-term projection of the prospective markets for it.

TABLE XXII

RELATIONSHIP OF IMPORTS OF CANADIAN CRUDE OILTO TOTAL CRUDE DEMAND IN MINNESOTA-WISCONSIN MARKETS, 1953-1960

(in thousands of barrels daily)

	1953	1954	1955	1956	1957	1958	1959	1960
Crude oil demand	293	305	329	341	352	365	379	394
Refining capacity	30.0	30.0	61.2	68.0	78.0	78.0	85.0	102.0*
as % of demand	10.2	9.8	18.6	19.9	22.2	21.4	22.4	25.9
Canadian imports	7	5	15	49	56	70	75	88
as % of demand	2.4	1.6	4.6	14.4	15.9	19.2	19.8	22.3
as % of capacity	23.3	16.7	24.5	72.1	71.8	89.7	88.2	86.3

\* Northwestern Refining at St. Paul Park will add 17,000 bbl/day to capacity in 1959, of which 50 per cent is assumed to be run on Canadian crude.

Source: Supplementary Submission of Shell Oil Company of Canada Limited, July, 1958.

Any estimate of the prospects of this market for Canadian crude must take into account the possibility that crude oil reserves may be established on a substantial scale in the Williston basin in North Dakota and Montana. Exploration in this area has had some favourable results. If these developments progress to the point where the construction of a pipe line from eastern Montana and North Dakota into the St. Paul-Minneapolis

area becomes feasible, United States crude would be given direct access to this market, thus eliminating the special transportation advantage now enjoyed by Canadian crude in the St. Paul-Minneapolis area.

The St. Paul-Minneapolis area is on the fringe of the very large and important Great Lakes area of the Middle West, which includes such refining centres as Chicago and Detroit. Canadian crudes have so far not secured any substantial outlets in this area, which represents almost one-fifth of the total market for petroleum products in the United States. In 1957 the area required some 1,582,000 barrels of petroleum products per day. On the basis of the growth of demand over the past 20 years in the area, the demand by 1967 would amount to some 2,600,000 barrels per day. As mentioned in Chapter 3, however, the refiners in the Great Lakes area of the Middle West traditionally have drawn their crude oil supplies from domestic sources, in which they have corporate interests, and have participated in the creation of a network of pipe lines from the major oil fields in Texas, Oklahoma, Kansas and Illinois.

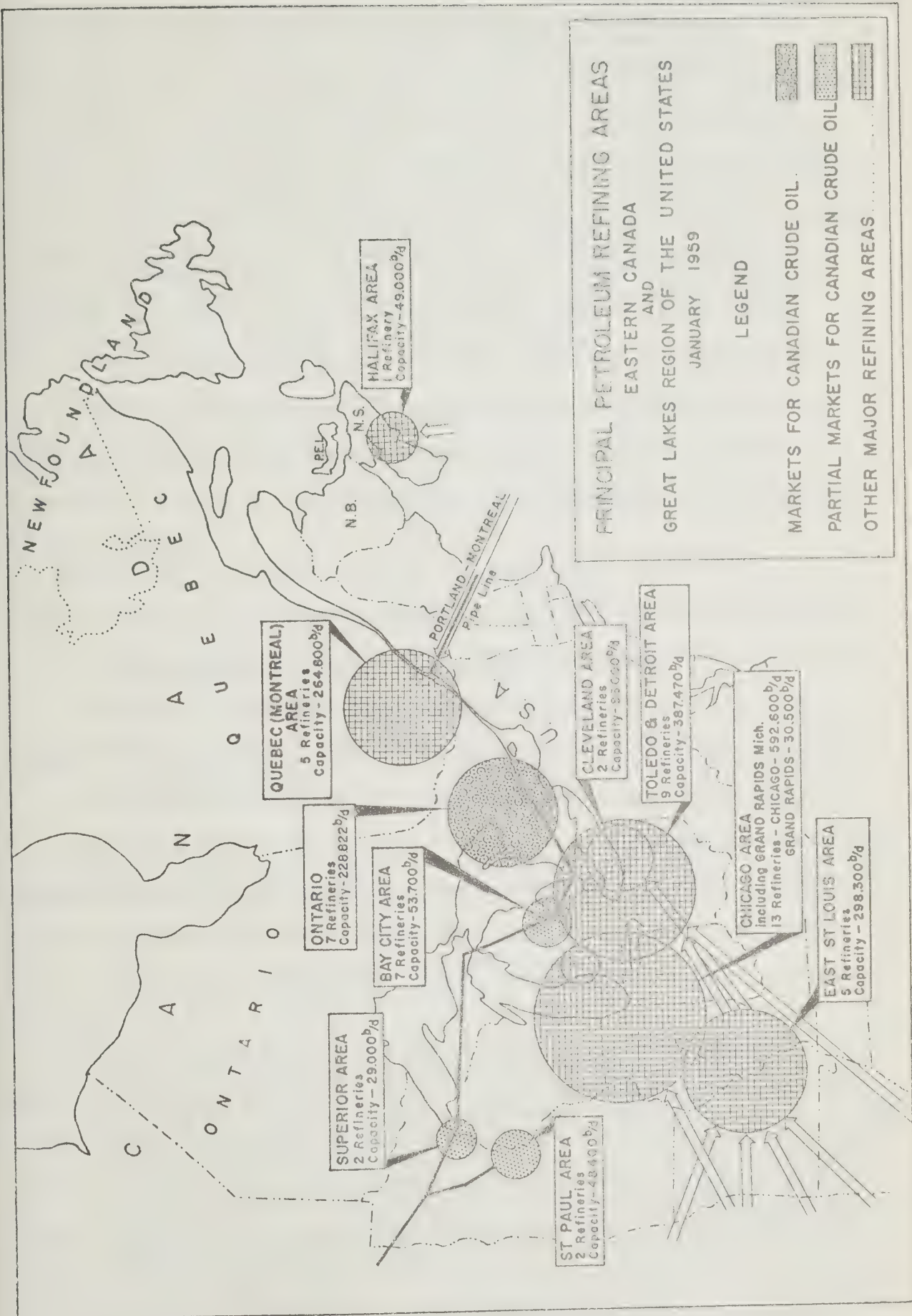
Since 1950 Wyoming has emerged as a new source of crude oil and now supplies approximately 15 per cent of the total annual refinery requirements of the Great Lakes area. The development of further reserves in the Rocky Mountain region would postpone the time when Canadian or overseas crudes might be needed in the Great Lakes area to supplement supplies from domestic sources.

To the extent that new domestic sources are inadequate to meet the annual growth in the huge Great Lakes area in the future, it is possible that as new pipe lines become necessary to supply increased demand, some of these would be linked to Canadian sources of crude oil. However, as the United States increases its imports from overseas sources, United States domestic crude may increasingly supply interior markets and overseas crudes the coastal markets.



Chart 11, "Principal Petroleum Refining Areas, Eastern Canada and Great Lakes Region of the United States, January, 1959", illustrates the magnitude of the Great Lakes refinery market. The size of this market is further demonstrated by the fact that the receipt of 200,000 barrels per day of crude from Canada would constitute less than 20 per cent of current crude oil runs in the area. It should be noted that, at the expected annual rate of growth of 5 per cent, crude oil receipts in the area will double over the period of the next 15 years. The Great Lakes market, therefore, from the point of view of its size, expected rate of growth and location seems to present favourable long-term prospects for the export of Canadian crude oil.

CHART II



### Estimates of Future Exports

Any attempt to estimate the prospects for exports of Canadian crude to the Pacific Coast or Middle West markets of the United States is made difficult not only because it is hard to predict the extent to which the markets will be in a deficit supply position but because of other uncertainties. There are hazardous assumptions to be made regarding the intensity of competition, either direct or indirect, to be faced by Canadian crude from other crudes. These assumptions involve the extent to which the world productive capacity of crude oil will exceed the demand, the likely trend of tanker rates and the influence which special corporate relationships will exert in the selection of the crudes to be imported into these market areas.

On certain assumptions, the prospects of expanded exports of Canadian crude to the Puget Sound area and perhaps other sections of the West Coast would appear to be attractive. The Puget Sound is a rapidly growing market for petroleum products. On the basis of posted prices Canadian crudes have been generally competitive in the area with foreign crudes; pipe line facilities from Canada to the area are in existence; and refining companies in the area have an indirect financial interest in Canadian production and in the pipe line facilities, through ownership of substantial reserves of crude in Western Canada and, with respect to Shell Oil, a definite financial interest in the pipe line facilities.

The prospects for Canadian exports of crude oil to the Great Lakes area of the Middle West would appear to be favourable over the long-term but the shorter term prospects are more problematical. This area, as already stated, constitutes a very large market for petroleum products and various industry estimates suggest that demand will continue to expand substantially. However, the supply pattern in the Great Lakes area is well established and the ability of Canadian crude to capture a portion of this market does not depend on price alone. As previously mentioned, refiners in the area have corporate interests in other sources of supply and in established transportation facilities. These factors are not conducive to any ready change from present sources of supply.

For the near future, the brightest prospects in the Middle West appear to lie in the St. Paul-Minneapolis area. Although the market in this area is not by any means comparable in size to the markets in either the West Coast or Great Lakes regions, Canadian crudes have a certain advantage in reaching the market, inasmuch as Canadian-American corporate relationships have already been established and pipe line facilities constructed. In the normal course of events, it would seem reasonable to assume that Canadian crudes will share in the growth of demand for petroleum products in the St. Paul-Minneapolis area.

The variety of conclusions which can be drawn with respect to the prospects for the export of Canadian crude to United States markets is apparent from the estimates presented to the Commission. These appear in Table XXIII.

TABLE XXIII

ESTIMATES OF CANADIAN CRUDE EXPORTS, 1959-1967

(in thousands of barrels daily)

Year	<u>British American</u> <u>Oil Co. Ltd.(a)</u>				<u>Imperial</u> <u>Oil Ltd.</u>		<u>Oil and Gas Conservation</u> <u>Board of Alberta</u>			
	<u>Low</u>		<u>High</u>		<u>Puget</u> <u>Sound</u>	<u>Middle</u> <u>West</u>	<u>Conservative</u>		<u>Optimistic</u>	
	<u>Puget</u> <u>Sound</u>	<u>Middle</u> <u>West</u>	<u>Puget</u> <u>Sound</u>	<u>Middle</u> <u>West</u>			<u>Puget</u> <u>Sound</u>	<u>Middle</u> <u>West</u>	<u>Puget</u> <u>Sound</u>	<u>Middle</u> <u>West</u>
1959	40	60	80	60	65	70	18	50	23	53
1963	40	60	250(b)	60	155(c)	90(c)	39	62	70	77
1967	40	60	420(b)	60	-	-	47	74	104	115

(a) The British American Oil Company Limited made three forecasts of exports. The minimum case assumed a constant export volume through to 1967 of 40,000 barrels per day to the Puget Sound area of the West Coast and 60,000 barrels per day to the Middle West. These were the export volumes at the time of the forecast. Each of the Company's other forecasts also assumed constant exports of 60,000 barrels per day to the Middle West, but for the West Coast the upper limit of potential export demand in 1967 was estimated to be 420,000 barrels per day and the intermediate forecast (not shown in this table) was 120,000 barrels per day.

(b) Estimate applies to the entire West Coast market.

(c) Predicted for the year 1962.

Source: Submissions to the Commission. The 1958-65 forecast by the Oil and Gas Conservation Board of Alberta was extrapolated to 1967 by the Commission staff. All of the forecasts in Table XXIII were made during the first half of 1958.



It will be noted that the estimates differ not only as to the total volume of exports but also as to the relative importance attached to the various market areas which might be served.

The market forecasts of Table XXIII were made in 1958 at a time when exports of Canadian crude were subject to the voluntary import control programme in the United States and when there were some indications that these controls would become mandatory and possibly more restrictive. These forecasts might well be modified in the light of the recent exemption of Canadian crude oils and petroleum products from these controls.

It is difficult to assess the full significance of this change in United States policy. It is clearly important that the United States has again recognized the unique position the Canadian oil industry can occupy as a continental source of supply, with all that this implies. The exemption is also very important because no orderly and progressive development of Canadian exports of crude oil to the United States could have been expected as long as Canadian crudes were subject to United States import controls. The exemption of Canada from United States mandatory import controls cannot be interpreted as effecting an automatic reinstatement of Canadian crude in United States markets in the volumes previously achieved in any of those markets. The choice of where individual refining companies in the United States, accessible to Canadian crudes, purchase their crudes is still that of the individual refiner. It is true that such refiners are now free to select Canadian crudes but with respect to the interpretation of certain of the provisions of the Presidential Proclamation, dated April 30, 1959, there would appear to be a difference of opinion as to whether or not such refiners, when they take Canadian crude, will lose some of the benefit of the quotas which they could otherwise secure. The Proclamation, however, makes it clear that the total importation of foreign crudes, whether from overseas or from Canadian sources, will not be permitted to interfere with the general purposes of the controls by discouraging domestic production.

While Canadian crudes may be fully competitive on a price basis, the broader interest of the refining companies and their overseas affiliated producing companies may be a considerable barrier to the export of large volumes of Canadian crude to United States markets. The exemption of Canadian crude does not, of course, remove certain other marketing obstacles which have developed from the application of United States import controls. An inter-company trading of "quota" oil for domestic oil can result in profitable exchanges for inland refiners in the United States. This trading of quotas, which are valuable rights in the United States, can adversely affect the acceptability of Canadian crudes to United States refiners and, indeed, under the voluntary import control regulations, did so affect Canadian crude in the St. Paul-Minneapolis area. In that area, during the latter part of 1958 and in the early months of 1959, Canadian crude lost some of its position to other crudes, probably indirectly supplied from Venezuela on an exchange of quotas. Furthermore, there may be reluctance on the part of United States companies to establish Canadian crudes as a stable or major source of supply, particularly if this means the investment of large amounts of capital in the construction of new pipe line facilities until, with the passage of time, the permanent nature of United States policy has been clearly established.

Following the Presidential Proclamation of April 30, 1959, the Commission requested the Oil and Gas Conservation Board of Alberta and certain of the oil companies in Canada to give it their views on the effect of the exemption from United States import controls on the exports of Canadian crude oil to that country. The difficulties referred to above are reflected in the views given to the Commission in response to this request. There was general agreement that the exemption was beneficial to the Canadian oil industry, particularly on a long term basis. There was much less agreement as to the more immediate effects of this exemption. Exports to the St. Paul-

Minneapolis area were not expected to increase very much, possibly by 5,000 to 10,000 barrels per day, so as to average 65,000 barrels per day in 1959. The exemption, however, was thought likely to enable a continuing growth of this order each year, so that exports to existing refineries might average 100,000 barrels per day in 1965. The general assessment by the industry would, therefore, tend to support the more optimistic estimates of this particular market area appearing in Table XXIII.

The main benefits were anticipated by the industry to arise in the Puget Sound area. Estimates of exports in the near future ranged from a slight increase over the May, 1959, level to as high as 90,000 barrels per day, rising perhaps to 150,000 barrels per day by 1965.

The Oil and Gas Conservation Board of Alberta felt that the exemption of Canadian crudes justified an increase in its earlier estimates of exports. An initial increase of some 15,000 to 25,000 barrels per day, together with relatively small amounts of liquified petroleum gases and products would, it was thought, be followed by further increases having the effect of raising the conservative estimates for the Puget Sound area, for 1963 and 1967, shown in Table XXIII, to 78,000 and 125,000 barrels per day respectively and the more optimistic estimates to 112,000 and 190,000 barrels per day in 1963 and 1967. Slight upward revisions of 10,000 to 15,000 barrels per day were made in the forecasts for the Middle West. The Board qualified its new estimates by drawing attention to various uncertainties affecting the export of Canadian crude to United States markets and stated that "this potential market is far less desirable than the Montreal market which provides not only a greater demand but also a more predictable future".

It should be noted that there has been an appreciable increase in nominations for Canadian crude oil by the Puget Sound refining companies for July, 1959. These companies have nominated for approximately 70,000 barrels per day, compared with 27,000 barrels per day in May.



This increase in actual exports is encouraging but it is clear that the prospects for a sustained growth in exports of Canadian crude will depend on the concerted marketing efforts of the crude oil producers in Canada and refiners in the United States, if Canada is to obtain the maximum advantage of the exemption accorded Canadian crude from United States import controls.

#### Canadian Markets

Estimates of the domestic demand for petroleum products in various regions of Canada over the next decade and of domestic demand for Canadian crude oil were submitted to the Commission by several companies. These estimates did not differ to any great extent from those submitted to the Commission by the Alberta Oil and Gas Conservation Board as shown in Tables XXIV and XXV. It is apparent from these estimates that Canadian crude is expected to be used to satisfy all but a small proportion of the requirements for petroleum products in British Columbia and the Prairie Provinces and an increasing share of the demand in Ontario.

TABLE XXIV

#### REGIONAL DEMAND FOR PETROLEUM PRODUCTS IN CANADA, 1955-1967

(in thousands of barrels daily)

Year	British Columbia	Prairies	Ontario	Quebec	Atlantic	Total
1955	69	141	212	159	57	638
1956	81	149	243	183	62	718
1957	80	154	252	188	67	741
1958	85	163	270	199	72	789
1959	90	174	292	212	77	845
1960	95	184	312	224	82	897
1961	100	195	334	237	88	954
1962	105	205	354	249	92	1,005
1963	110	215	375	261	96	1,057
1964	116	226	394	274	101	1,111
1965	122	237	414	288	106	1,167
1966	128	248	434	303	111	1,224
1967	134	259	454	318	116	1,281

Source: Alberta Oil and Gas Conservation Board: Figures for 1966-67 were extrapolated by the Commission staff from the Conservation Board's 1958-65 forecast.



TABLE XXV

CANADIAN DEMAND FOR DOMESTIC CRUDE OIL\* 1955-1967

(in thousands of barrels daily)

Year	British Columbia	Prairies	Ontario	Total
1955	53	150	111	314
1956	61	163	134	358
1957	62	153	141	356
1958	62	152	155	369
1959	77	170	199	446
1960	81	180	221	482
1961	85	191	246	522
1962	89	201	306	596
1963	93	211	330	634
1964	98	222	349	669
1965	103	233	369	705
1966	108	244	389	741
1967	113	255	409	777

\* Includes natural gas liquids.

Source: Alberta Oil and Gas Conservation Board: Figures for 1966-67 were extrapolated by the Commission staff from Conservation Board's 1958-65 forecast. The Board also prepared a forecast assuming that Canadian crude would supply Montreal refineries, as referred to in Table XXXV of Chapter V.

Markets in the Prairie Provinces were generally considered by the industry as being permanently captured for Canadian crude oil. The declining competitive position of Canadian crudes in the Puget Sound area has led to some concern as to whether these crudes might eventually prove incapable of competing even in Vancouver. Questioned on this matter, Shell Oil Company of Canada Limited told the Commission that Vancouver was considered a "long-term basically economic" point at which to sell Canadian crude. The Company stated that the California market, on the other hand, was not. Such points as Vancouver, the Company felt, would always be held for Canadian production, despite any temporary price advantage which might be gained from time to time by using imported supplies. The large financial interest, direct and indirect, of the Vancouver refining companies in the Trans Mountain oil pipe line, in addition to their investment in crude oil reserves in Canada, would tend to reinforce the view that this refinery area could be maintained as an outlet for Canadian crude. The situation, however, could become increasingly precarious if the laid-down cost of foreign crude became substantially less than that of Canadian crude. It is conceivable also that imports of refined products, manufactured from lower cost foreign crudes, could compel the refining companies to replace Canadian with cheaper foreign crude. The forecast in Table XXV assumes the continuing use of Canadian crude in Vancouver and indicates a steady growth in the demand for Canadian crude in the markets of British Columbia and the Prairie Provinces, rising from 214,000 barrels per day in 1958 to 368,000 barrels per day in 1967. This is an increase of 72 per cent over the next decade or an average annual compound rate of  $5\frac{1}{2}$  per cent.

In testimony before the Commission, the major oil companies stated that, in their judgment, the area of greatest potential growth in the use of Canadian crude is the Province of Ontario. The estimates of the Oil and Gas Conservation Board of Alberta, as shown in Table XXV, also support

this opinion. This growth is related, in part, to a forecast of a greatly increased consumption of petroleum products in Ontario. It is also expected to result from the intentions of the industry, expressed to the Commission, to use Canadian crude entirely in the Ontario refineries and to expand these refineries. Such a programme would ultimately involve the displacement by Canadian crude of the small volume of foreign crudes now imported into Ontario and a progressive displacement over much of the area of the refined products now being imported mainly from the United States or brought in from the refineries in the Montreal area. The estimates in Table XXV are based on the assumption that these displacements will, in fact, take place. It will be seen from the Table that the use of Canadian crudes in the Ontario refineries is estimated to rise from 155,000 barrels per day in 1958 to 409,000 barrels in 1967, thus accounting for a major proportion of the expected expansion in the domestic market. The forecasts given to the Commission indicate that the most rapid rate of growth in Ontario is anticipated during the next five years.

This rapid increase in the use of Canadian crudes in Ontario during the next five years will depend very largely on whether the Ontario refiners succeed in carrying out their intentions. Several refining companies have indicated that they are in a position to increase their use of Canadian crudes by substituting these for imports. The British American Oil Company Limited indicated that by 1959 it would be using Canadian crude exclusively at its Clarkson refinery. Small quantities of Venezuela and United States crudes were being used early in 1958 by Sun Oil Company Limited at its refinery in Sarnia, Ontario. This use of United States crude was discontinued in June, 1958, and since then approximately 70 per cent of this refinery's crude requirements have been met from Canadian sources and 30 per cent (i.e., 5,000 bbl/day) from Venezuela. The Venezuela crude moves by tanker to the United States Gulf Coast and thence via several pipe line systems to Sarnia. The

Company claimed that the laid-down price is competitive with Canadian crude, but that despite this it made earnest but unsuccessful efforts to trade this crude with eastern Canadian refineries in exchange for western Canadian crude. The Company has indicated to the Commission that these imports will probably be discontinued in the near future.

The displacement of some imported products presents greater difficulties. This would require either the increased manufacture of certain products not presently produced in sufficient quantity in Canada, resulting in surpluses of other products, or changes in the balance of refinery yields. Refined products currently imported consist largely of heating oils, aviation gasoline and lubricants. Imperial Oil Limited has stated its intention of increasing its refinery yield of heating oils in Ontario. A similar policy on the part of other refiners could bring about some increase in the use of Canadian crudes. At the same time, it is generally recognized that, having regard to seasonal variations in demand and for purposes of flexibility and efficiency in refinery operation, Canadian refineries must rely on a small percentage of product imports.

A substantial part of Ontario's requirements for petroleum products has been met by shipments from the Montreal refineries by means of a products pipe line, the Trans-Northern pipe line, extending from Montreal to the Toronto-Hamilton area. This line has a capacity of 80,000 barrels per day and is owned by three of the major oil companies, The British American Oil Company Limited, Shell Oil Company of Canada Limited and Texaco Canada Limited. These companies have stated that they anticipate that the western flow of products through the line beyond Cornwall will terminate by 1962, thus effecting the displacement in eastern Ontario and Toronto-Hamilton markets of the products presently refined from foreign crude in Montreal by products refined from Canadian crude in the Toronto area refineries. Representatives of the companies concerned stated to the Commission that it was considered economically



feasible to take over this market with products refined from Canadian crude.

As part of this programme, Texaco Canada Limited has completed the expansion of its Port Credit refinery from 14,000 to 20,000 barrels per day and has built a spur line from the refinery to the Trans-Northern products pipe line. This has had the effect of expanding the Company's shipments of products to areas in the westerly section of this pipe line. Late in 1958 a new refinery with a capacity of some 20,000 barrels per day was also brought into operation in the Toronto area by Cities Service Oil Company Limited. The capacity of the refinery of The British American Oil Company Limited at Clarkson was increased by some 36,000 barrels per day during 1957, with the result that the Company's shipments of products from its refinery in Montreal into the Ontario market have since been confined to the region east of Toronto. Shell Oil Company of Canada Limited has no refinery in the Toronto area. Although the Company indicated to the Commission its intention of constructing a refinery in 1960 it stated that no definite decision had been made. Imperial Oil Limited already has substantial refinery capacity in Sarnia, so that its shipments of products from Montreal into Ontario are principally limited to the Ottawa Valley by way of railway tank car.

The estimates of increased use of Canadian crude in Ontario are based on the assumption that it will remain sufficiently competitive at Toronto with crudes imported into the Montreal refinery area to enable the industry to carry out its proposed programme. These estimates are appraised later, but, assuming them to be correct, they indicate a rapid increase in the use of Canadian crude in Ontario from some 150,000 barrels per day in 1958 to over 300,000 barrels per day in 1962, and to over 400,000 barrels per day in 1967. Thereafter the growth

will be equal to the normal increase in demand in Ontario for petroleum products. The present facilities of the Interprovincial Pipe Line Company are capable of ready expansion, by the use of additional pumping facilities, to meet the growing volumes of estimated throughput for the period 1958-62. Further investment, amounting to what the Company estimated to be \$116 million, would be required to provide for the additional throughput which is anticipated for the later period.

The British American Oil Company Limited estimated that, as a result of the expansion of refining operations in Ontario and the resultant displacement in Ontario of products refined in Montreal, there would be a lower utilization of crude in the refineries in the Montreal area. The Company concluded that crude runs at Montreal refineries will be 222,600 barrels per day by 1962, compared with an expected capacity of at least 290,000 barrels per day at that time. Total crude runs at Montreal refineries averaged 234,000 barrels per day in 1958. The increase in refinery output in Montreal after 1962 would be largely related to the growth in product demand in Quebec. As a result of this decline in refinery output in Montreal there would be a temporary drop in imports of crude oils into Montreal.

A comparison of the estimates given in Tables XXIV and XXV indicates that crude oil import requirements of Canada as a whole will be somewhat less in 1962 than they were in 1958. It also indicates, however, that subsequent to 1962 there will be an increase in crude oil import requirements because the difference between total product demand and domestic crude oil supply in the year 1967 will be some 500,000 barrels per day compared with about 410,000 in 1962. Part of this increase would, of course, be due to the growth in crude oil requirements in the Maritimes which are solely dependent on foreign crude.

Estimates of Future Production  
and Resource Development

Levels of Production

The Alberta Oil and Gas Conservation Board submitted to the Commission an estimate of the growth of the productive capacity of the Canadian oil industry over the next decade. The estimate was made largely by projecting recent trends into the future. By comparing the results with the expected level of demand for Canadian crude in domestic and export markets, the Board calculated the ratio of production to producibility which could be anticipated each year until mid-1960. The estimate of markets makes no provision for deliveries of domestic crude oil to the Montreal market. However, it does provide for both a conservative and an optimistic level of exports.

In projecting future productive capacity the Board did not assume there would be any substantial change from the recent levels of exploration and development. In reality, of course, demand, price levels and investment incentives in the future will all affect the extent of exploration and development and thus the eventual productive capacity of the industry. This qualification should, therefore, be kept in mind when examining the future production-producibility ratios under the various market assumptions, as shown in Table XXVI.

TABLE XXVI  
ESTIMATED CANADIAN CRUDE OIL PRODUCTION AND PRODUCIBILITY

1958-1967

(in thousands of barrels per day)

Year	<u>Production</u>		<u>Producibility</u>	<u>Production/Producibility</u>	
	Conservative	Optimistic		Conservative per cent	Optimistic per cent
1958	456	456	1,004	45	45
1959	512	520	1,072	48	49
1960	557	577	1,157	48	50
1961	611	642	1,250	49	51
1962	690	728	1,320	52	55
1963	733	779	1,386	53	56
1964	773	829	1,445	53	57
1965	814	882	1,486	55	59
1966	856	938	1,523	56	62
1967	896	994	1,556	58	64

Note: Both production forecasts assume that demand in the domestic market will rise to 777,000 barrels per day by 1967, as shown in Table XXV. The difference between the "conservative" and "optimistic" estimates of production are therefore due solely to the use of different assumptions concerning the increase in exports over the next decade. These export estimates are shown in Table XXIII.

Source: Alberta Oil and Gas Conservation Board: Forecast of the Canadian Demand and Supply for Crude oil and Products, 1958-65. Figures for 1966-67 were extrapolated by the Commission staff.

It will be seen that, according to these estimates, the ratio of production to the productive capacity of the industry would increase from 45 per cent in 1958 to 58 per cent in 1967, if exports do not increase above the Board's "conservative" estimate of 121,000 barrels per day (see Table XXIII) by that time. The more "optimistic" export estimate of 219,000 barrels per day by 1967 would provide for production at a level of 64 per cent of capacity.



As noted earlier, the Board recently revised its estimates of future exports to take account, in part, of the exemption of Canadian crudes from United States import restrictions. It felt that such revised estimates should be qualified by reference to the uncertainty of United States markets. However, if these recently revised estimates are used, the ratio of production to producibility in 1967 would change from 58 to 64 per cent under the "conservative" assumptions regarding exports and from 64 to 70 per cent under the more "optimistic" assumptions. The revised "conservative" estimate suggests an approximate production for Canada in 1967 of 990,000 barrels per day and the "optimistic" estimate, 1,085,000 barrels per day. If, due to an improvement in the volume of exports, these levels of production are achieved, the production-producibility ratio should be higher in the future than it has been in the last three years. The recent ratio of production to producibility has ranged from 45 to 60 per cent. An increase in the ratio to a level of 64 to 70 per cent would represent a very substantial increase in the general level of activity of the industry.

If increased exports materialize there will be a higher level of exploration and development because of the need to establish the additional reserves to sustain a resultant higher rate of production and provide for a suitable reserve at the end of the period under review. The increase in gross oil reserves in Canada during the period 1952 to 1958 averaged 450 million barrels per year. This rate of finding is somewhat higher than the 355 to 420 million barrels per year which would be required to meet the production requirements of the revised market estimates referred to above and leave reserves equivalent to 12 times the production of the predicted level of output in 1967. This 12 year life-index is comparable to the position which has prevailed in the United States over the past few years. The annual increase in reserves in

Canada over the period 1952 to 1958 is also considerably higher than the rates of discovery which would be required to meet the levels of production originally forecast by the Board. Under those circumstances an average rate of between 321 and 378 million barrels per year would have been required on the basis of a 12 year life-index.

However, the life-index of 12 years of future supply, assumed in these calculations, is a low index to apply to the Canadian industry in its present stage of development. While the annual discovery rates in the United States provide for an approximate reserve life-index of 12 years, it would probably be more prudent for Canada to operate under a higher reserve life-index, having regard to the relatively short exploration history of the Canadian industry. Consequently, the above estimates of annual discovery rates are likely to be considered by the industry as the absolute minimum necessary to support the hypothetical levels of production. The 1957 and 1958 reserve life-indices in Canada were actually 18 and 22 years respectively. If a remaining reserve equivalent to 18 years of production is provided for, the average addition of new reserves would have to be approximately 650 million barrels per year to meet the higher of the Board's revised estimates. Consequently, under such an assumption, a much higher level of exploration than has been experienced over the past five years would be required.

Changes in posted prices of overseas crudes have led to a reduction in field prices of Canadian crudes. As a result, the revenues earned on each barrel of oil produced for both domestic and

export markets will be lower than had been anticipated when market prospects and the resultant level of activity in the industry were discussed before the Commission. The decline in field prices in Canada, while directing attention to the question of possible cost reductions, has given added emphasis to the need for market expansion and increased volumes of production. The decline in the price of imported crudes also suggests that less confidence than heretofore can be attached to the forecast of expanded domestic markets appearing in Table XXV. This expansion, in the immediate future, would depend to a considerable degree on the plans of the industry to displace imported crudes and petroleum products in the Canadian markets.

#### Field Prices - Recent Changes and their Implications

Whether or not the forecasts of markets for Canadian crude discussed above will be realized depends upon a number of factors. The ability of the industry to extend or even to maintain its existing markets at home and abroad might be adversely affected, for example, by any further intensification of the competition of overseas crudes and products. The increase in competition is the result of changes that have taken place over the last year or more in the world oil situation. During this time a pronounced surplus of crude oil and refined products has developed and there has been a tendency towards lower prices for overseas oils. Following reductions in certain posted prices in the United States the decline in posted prices of overseas crudes commenced in February, 1959, in Venezuela with a reduction of 15 cents in the price of crudes which are typical of those imported into Canada. Shortly thereafter posted prices in the Middle East were reduced 18 cents per barrel. In April, posted prices of Venezuela crude were further reduced by 10 cents per barrel. To some extent these reductions in posted prices were a recognition of the fact that many international sales were already being made at discounts below posted prices, thereby undermining the structure of posted prices and creating difficult problems for the concessionaire companies and the conceding authorities.

The extent of this decline in the posted prices of overseas crude in the early months of 1959 was such that overseas oils might well have been able to invade the Ontario market in substantial quantities, thereby reducing the market for Canadian crude. There was a possibility, for example, that, as soon as navigation in the St. Lawrence reopened, some overseas crudes might have found a market in one or more of the Ontario refineries, thus interfering with the use of Canadian crudes on which these refineries depend at present. There was a somewhat greater possibility that, without an equivalent decline in the price of Canadian crudes, some of the oil companies with refineries in Montreal would have been induced to continue and perhaps to expand the sale of Montreal refined products in the Ontario market, instead of allowing this market to be supplied to an increasing degree by products refined in Ontario from Ontario crude. Similarly, there would have been a greater inducement for jobbers in Ontario and Quebec to purchase their product requirements from the Caribbean and other overseas areas rather than from Canadian refineries. Any of these developments would have served to reduce the demand for Canadian crude and thus prevent or postpone the realization of the market expectations in Ontario referred to in previous pages.

The decline in the price of overseas crudes and products might have given rise to an increase in the use of overseas products in the Vancouver refinery area and might also have had adverse implications for the export of Canadian crudes to the Puget Sound area and, to a lesser extent, the Middle West area of the United States.



The Canadian refineries reacted to this increase in potential competition by reducing the posted prices for crudes in Western Canada in March, 1959, by 14 cents per barrel in Alberta and by 17 cents per barrel in the other two Prairie Provinces. Almost simultaneously the Interprovincial Pipe Line Company reduced its transportation tariffs from Edmonton to Sarnia and Toronto, to mention only the principal changes, by 8 and 12 cents per barrel respectively. However, the subsequent reduction of 10 cents per barrel in the posted price of Venezuela crude was not followed by a further reduction in the posted prices of Canadian crude.

The reductions in field prices and pipe line tariffs were presumably required to counter the challenge to the position of Canadian crudes and refined products in their present markets and particularly in Ontario. They had the effect of restoring the former competitive position of Canadian crude in this important market area, as well as in Vancouver, the Puget Sound and other markets. Had Canadian field prices not been reduced, a situation could have arisen whereby at least a partial shift from the use of Canadian to the use of overseas crudes and products in markets in Ontario and British Columbia would have occurred. The commercial preferences of the integrated Canadian oil companies, of course, would have served to protect the domestic markets for Canadian crude to some degree. Many of the refineries in Ontario and British Columbia have a vested interest in the continued use of Canadian crude because of their ownership of large Canadian reserves of crude and their financial interest in the trunk pipe lines. Some of the refineries, however, are less involved financially than others in Canadian production and pipe line operations and might have found it expedient, in due course, to purchase overseas rather than Canadian crude. The decision of the refineries to reduce field prices and of Interprovincial to reduce pipe line tariffs obviously helped to lessen the danger of an increase in imports.

The price reductions in February, 1959, in Venezuela and the Middle East resulted in a fundamental change in the method of determining field prices in Western Canada. The subsequent reduction in such field prices was the first occasion in the experience of the Canadian industry when field prices have been reduced in direct response to changes in the price of overseas crudes, as distinct from that of United States crudes. It can be regarded as a distinct break in the historic relationship between the price of Canadian and Illinois crudes. The price of Canadian crudes at the refineries, and thus in the field, has become associated with and dependent upon the price at which overseas crude or products or Montreal-refined products might be laid down in the Toronto area. The result has been that the price of comparable Canadian crudes at the refineries in Sarnia and in the Toronto area is now roughly 20 cents per barrel lower than the price at which Illinois crudes could be delivered to the same refineries. Although field prices in Western Canada have always been lower than the field prices of competing United States crudes, reflecting the longer distance over which Western Canadian crude must be transported to the same market, the differential between Canadian and United States field prices has now become greater than heretofore.

The new situation has important implications for the Canadian producing industry. The structure of well-head prices in Canada is no longer supported by field prices prevailing in the United States. In one respect this is obviously disadvantageous to Canadian producers. United States field prices are likely to be higher than world oil prices because the United States price structure is now largely insulated from the influence of overseas prices due to the

import control policy in force in that country. If crude oil prices in the United States should rise at any time in the future there is less likelihood than heretofore that Canadian field prices would rise correspondingly. On the contrary, the threat of competition of imported overseas oils in Canada will have the effect of keeping the Canadian price structure in line with the lower level of world prices.

This situation could mean that in the future Canadian crude might be laid down in certain United States markets at prices more competitive than heretofore with those of United States crudes. In short, in the Puget Sound and the Middle West areas and ultimately in any other market areas in the United States that may become available, Canadian crudes should be able to compete more effectively with United States domestic crudes. At the same time, with Canadian field prices being based on the price of overseas crudes, the competitive price position of Canadian crude in relation to that of overseas crude should continue. The maintenance of petroleum prices in Canada at a level which will enable Canadian crude to compete in United States domestic markets is important if the industry is to develop a larger volume of exports than it has achieved in the past.

The change from Sarnia as the basing point for the determination of well-head prices in Canada, however, suggests that the industry is now more subject than before to the forces of international competition and, in particular, to the competitive cost and other advantages of crudes from the Middle East and Venezuela. Further declines in overseas prices would aggravate the problems which faced the Canadian industry in the early months of 1959. Unless future price changes were matched by reductions in Canadian well-head prices, there could be a substantial importation of overseas crude and products into Ontario by tanker during the summer months. There might also be an

increase in the use of overseas crudes in Montreal giving rise to the continued marketing of Montreal-refined products in Ontario. Developments of this nature could cause the plans of the industry for expanding the market for Canadian crude to be postponed. Apparently the industry feels that this danger is already present. The Canadian Petroleum Association in a policy statement issued on April 16, 1959, said:

"The Canadian Petroleum Association strongly urges the Government of Canada to help relieve the crisis in the producing industry, caused by the increased gravity of the world oil surplus. This threat to Canada's economic welfare results largely from conditions and recent actions outside Canada, which may displace domestic crude oil from markets presently served.

The Association has noted with regret that the world petroleum situation has deteriorated to a point where Canadian crude oil may no longer be able to compete in Canadian markets which are open to the importation of distress crude oil and products. Because the problem and the solution to it are so vital to the nation as a whole, the Association recommends that:

1) The Government of Canada immediately sponsor a meeting of leaders of Canada's petroleum industry, representing producers, transporters, refiners, marketers and importers. This meeting should seek a voluntary arrangement satisfactory to Government that will ensure the maximum practical use of Canadian crude oil in the market areas in Canada, from the Pacific Coast to the major consuming areas of Eastern Canada. The objective should be to utilize to the maximum extent possible all pipeline, tanker and refinery facilities in Canada which are or can be readily connected to Canadian reserves of crude, giving domestic oil priority to this extent in serving domestic markets. The Association earnestly hopes that industrial statesmanship will prevail at such a meeting so that voluntary actions under Government sponsorship will be entirely effective. We believe that the Government of Canada should give strong and effective leadership to such a meeting to ensure that an adequate program is adopted.

2) The Association is concerned that imports of foreign crude oil or refined products into Canada may increase abnormally during the negotiations and planning for a voluntary control program. We believe the Government should ensure that sufficient information is available to expose any substantial change in the supply of foreign crude and products while such voluntary program is being developed.



The Canadian producing industry requires opportunity to grow in new markets in Canada and in export areas. It is hoped that the actions suggested above for the immediate problem will promote and help the early resolution of the broad longer-range problems of oil markets for a Canadian industry which is capable of playing a progressively more important role in the expansion of the Canadian economy."

One method of preventing the loss of markets would be for the refineries to counter such potential foreign competition by reducing the price of products refined domestically, involving a reduction in the profit margins of the refineries. There are obvious limits to an approach of this kind. Further reductions in field prices in Western Canada would also reduce the danger of increased imports but undoubtedly would adversely affect the incentives for exploration and development, as well as the revenues of the producing provinces.

As noted earlier there was some decline in the level of investment in exploration and development in the oil industry in Canada in 1957 and 1958. However, it is not uncommon in the oil industry for exploration to continue on a large scale at a time when the immediate prospects of improved markets or prices are not particularly favourable. This is exemplified by the exploration programmes of certain international companies in the Middle East during the 1930's and by the exploration which has been taking place recently not only in the Prairie Provinces but in the Northwest Territories including the Arctic Islands. It would appear that producing companies which have the necessary resources tend to take the long rather than short view of future market prospects.

There are many factors which in any year affect the level of expenditures for exploration and development but the primary ability to make such expenditures comes from the actual and anticipated revenues from production. If the industry in Canada can secure the revenues of increasing sales of natural gas discovered incidental to its search for oil or in the direct search for gas this will undoubtedly stimulate the level of expenditures

for exploration and development. One of the major companies has recently estimated that, at current contract prices, the gross revenues from sales of natural gas and by-products thereof would amount to nearly \$50 million by 1964.

The immediate situation is that the industry, having suffered a decline in markets in 1958, has been confronted in 1959 with a decline in field prices. The lower realization of the industry on the oil which it produces has placed an added emphasis on the need to secure additional production. The decline in field prices and low level of production has created the danger that the ability as well as the incentive of the industry to finance new exploration and development may be impaired. There is also the risk that, if the profits to be earned from oil exploration in Canada should decline in relation to earning possibilities in the United States oil industry and elsewhere, the attractiveness of the oil industry as an outlet for international investment could diminish substantially.

One argument presented to the Commission was that if the industry is to maintain the rate of exploration and development activity experienced over the last two or three years the gap between actual and potential production must be lessened by the securing of additional markets. Emphasis was placed on the adverse effects which a large amount of "shut-in" capacity has on the incentive for exploration and development, particularly in the case of the smaller independent producers. Unless the markets for Canadian crude grow in line with the expansion of production capacity, it was said, it would not be possible for producers to earn sufficiently large revenues in the earlier years of the operation of their producing properties. This constitutes a special source of difficulty for those companies which do not possess the financial resources to continue drilling, apart from the funds obtained from the sale of current production or from short-term borrowing based on future production. If markets do not expand more rapidly, it was said, such producers will not be able to continue drilling and, in extreme cases, may be forced to

sell out to other companies in a stronger financial position. The importance of the independent companies is illustrated by the fact that as a group they have been responsible during the past decade for about 45 per cent of exploratory drilling in Canada. The rapid development of the industry in the past 10 years, stimulated as it was by the Korean War and by the Suez crisis, brought many new companies into being and encouraged a greater amount of exploration expenditures financed by borrowing. The subsequent disappointment in market expectations was said to have put some of these companies in financial straits and the reduction in field prices in March, 1959, has undoubtedly added to their problems.

Investment by the industry in exploration and development has played an important part in the generation of employment, income and economic activity in Canada. The magnitude of the growth of capital investment in the producing sector of the industry is indicated in Table XXVII, which includes most of the direct income-generating expenditures of a capital nature but does not include payments to provincial governments for mineral rights.

TABLE XXVII

CAPITAL EXPENDITURES IN THE PRODUCING INDUSTRY\*, 1947-1959

(in millions of dollars)

Year	Exploration	Development and Production	Total
1947	**	9.5	9.5
1948	**	37.3	37.3
1949	**	45.0	45.0
1950	**	53.9	53.9
1951	**	72.1	72.1
1952	59.8	101.6	161.4
1953	59.1	107.2	166.3
1954	55.1	126.8	181.9
1955	67.4	201.6	269.0
1956	73.7	252.4	326.1
1957	77.3	237.8	315.1
1958	63.7	199.7	263.4
1959 (forecast)	<u>59.7</u>	<u>216.8</u>	<u>276.5</u>
Total	515.8	1,661.7	2,177.5

\* The Canadian Petroleum Association has estimated total expenditures of all types relative to the acquisition and development of oil and gas reserves and the operation of wells at \$2,805.7 million for the period 1951-57. Capital expenditures for this period, as shown in the above table, would amount to \$1,491.9 million.

\*\* Reported in "Development and Production" expenditures.

Source: Dominion Bureau of Statistics, Ottawa. (Forecast for 1959 made in March, 1959).

When investment in other phases of the petroleum industry is also considered, the growth and importance of the Canadian oil industry during the past decade becomes even more apparent. The relative importance of capital investment in the industry is indicated by the fact that capital investment of \$946 million in 1957 represented 10.7 per cent of total capital investment in Canada in that year. In 1947 the industry accounted for only 2.2 per cent of total investment. The industry has, therefore, been an important factor in contributing to the increase in capital investment and, consequently, to the high level of economic activity in Canada in recent years.

The decline in oil production in Canada in 1958, the diminished prospects of future exports of crude oil to the United States at that time and the relatively high degree of shut-in capacity, affecting the Province of Alberta in particular, led that province and sections of the producing industry to support a policy of supplying the Montreal market with Canadian crude. This market is the only remaining major domestic market which secures its crude supplies from overseas sources. The feasibility of marketing Canadian crude in Montreal and the issues associated with government action to accomplish this were prominent in the Commission's hearings.





## CHAPTER 5

### THE MONTREAL MARKET

#### Montreal as a Refining Centre

Most of Canada's crude oil imports are purchased by the Montreal refineries. The refineries in this area have traditionally relied on foreign sources of crude and the Montreal refining centre has long been the largest market for crude oil in Canada, representing about one-third of the nation's total refining capacity. It has played an important role in meeting the eastern Canadian requirements for petroleum products.

Eastern Canada, for these purposes consisting of Ontario, Quebec and the Maritime Provinces, provides the market for approximately 60 per cent of Canada's demand for petroleum products. Some 15 per cent of the demand in this area has been met in the past from product imports, the remainder being supplied by the refineries of the region. In 1958, two-thirds of the requirements for crude oil were supplied by imported crudes. The remaining one-third came almost entirely from Western Canada, its use being confined to refineries in Ontario.

Tables XXVIII and XXIX illustrate the supply and demand situation in Eastern Canada in 1958 and the relationship of refinery capacity to product demand in Ontario, Quebec and the Atlantic Provinces.

TABLE XXVIII  
PETROLEUM SUPPLY AND DEMAND  
IN EASTERN CANADA, 1958  
(in thousands of barrels per day)

	Ontario	Quebec	Atlantic Provinces
<u>SUPPLY</u>			
Crude production	2	-	-
Natural gas liquids production	-	-	-
Other materials used	-	-	-
Imports - crude	11	234	43
- products	20	24	23
Transfers between areas			
- crude	164	- 3	-
- products	<u>60</u>	<u>-62</u>	<u>2</u>
New supply	257	193	68
<u>Inventory change</u>	<u>(9)</u>	<u>(7)</u>	<u>(2)</u>
Total supply	266	200	70
<u>DEMAND</u>			
Domestic demand	265	199	70
Exports - crude	-	-	-
- products	<u>1</u>	<u>1</u>	<u>-</u>
Total demand	266	200	70

Source: Compiled by Commission staff from data supplied by the Dominion Bureau of Statistics. (Preliminary estimate).

TABLE XXIX  
REFINERY CAPACITY AND PETROLEUM PRODUCT DEMAND  
IN EASTERN CANADA, 1958

Province	Refinery capacity December 31, 1958		Petroleum product demand	
	barrels per day	per cent	barrels per day	per cent
Ontario	228,822	42.1	265,000	49.7
Quebec	264,800	48.8	198,745	37.2
Atlantic Provinces	<u>49,300</u>	<u>9.1</u>	<u>70,082</u>	<u>13.1</u>
	542,922	100.0	533,827	100.0

Source: Compiled by Commission staff from data supplied by the Dominion Bureau of Statistics and Department of Mines and Technical Surveys. (Preliminary estimate).

The only refinery in the Atlantic Provinces, aside from a small plant near Moncton, New Brunswick, using local crudes, is the Imperial Oil Limited refinery at Halifax, although in 1959 construction of a refinery was commenced at St. John, New Brunswick, by Irving Oil Company Limited. The approximate average 1957 imports of crude oil for the Halifax refinery were 40,500 barrels per day. This crude oil came from Venezuela and had an approximate A.P.I. gravity of 30°. This refinery has a capacity of 49,000 barrels per day. The St. John, New Brunswick, refinery of Irving Oil Company Limited will have a capacity of approximately 40,000 barrels per day.

It is apparent from Tables XXVIII and XXIX that the Montreal refineries, which are the only refineries in the Province of Quebec, use the largest proportion of the crude oil refined in Eastern Canada, amounting in 1958 to over 50 per cent of the total. On the other hand, Quebec accounted for only 37 per cent of the total product demand in Eastern Canada in 1958. A comparison between crude oil consumption and provincial product demand illustrates the importance of Montreal refineries in supplying petroleum products to Eastern Canada. In 1958, as indicated by Table XXVIII, Montreal refineries supplied 60,000 barrels of products per day to Ontario and 2,000 barrels per day to the Maritimes. However, with the expansion of the refining industry in the two latter areas, shipments of products from the Province of Quebec will tend to decrease in the future. This is already evidenced by the fact that shipments from this province in 1957 amounted to 74,000 barrels per day.

Table XXX shows that, with the exception of the period towards the end of World War II, Montreal has been the most important refining centre in Eastern Canada for many years. Chart 12, "Petroleum Refineries in Canada", further illustrates the importance of the Montreal refining centre.

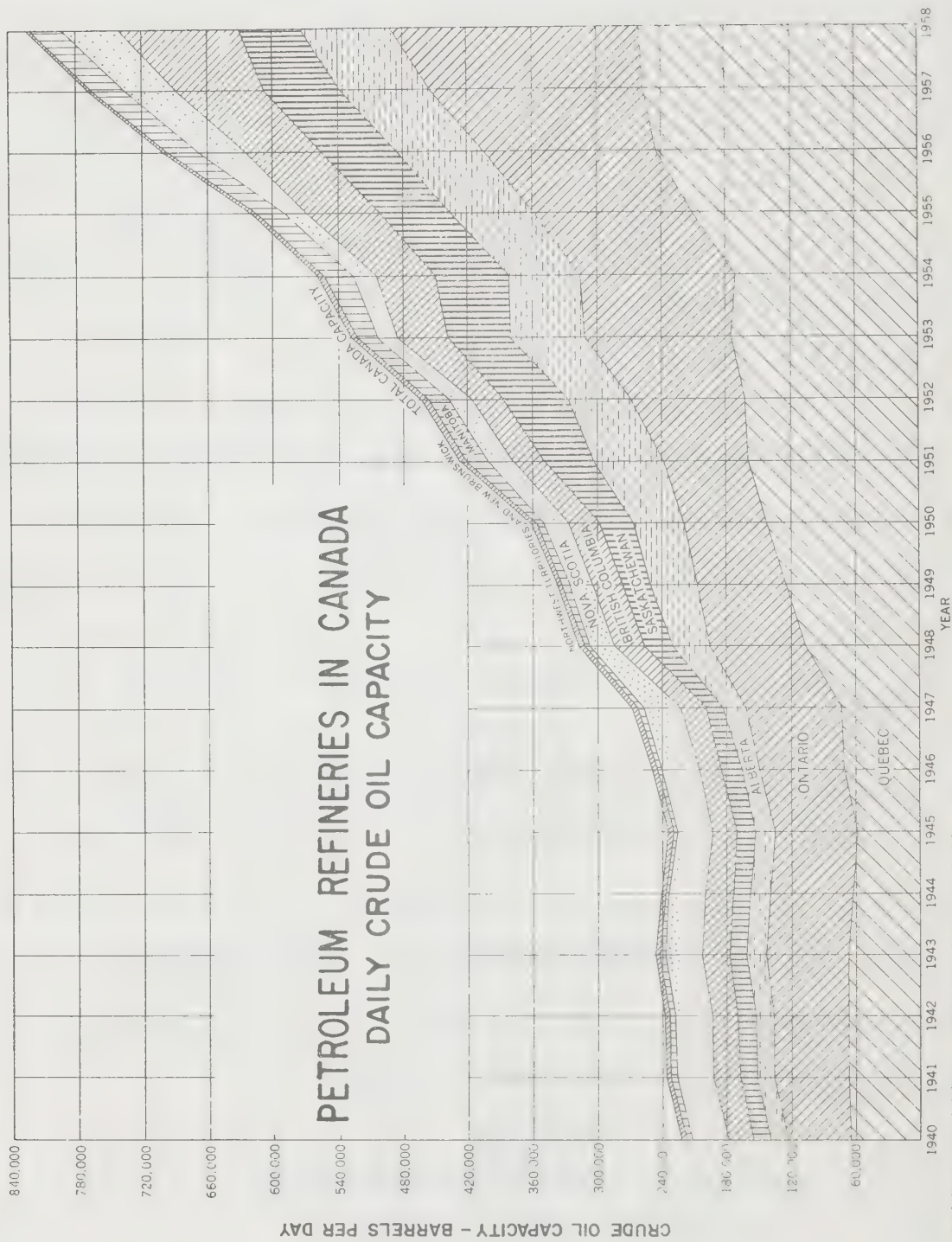
TABLE XXX  
PERCENTAGE OF PETROLEUM REFINING CAPACITY  
IN EASTERN CANADA BY AREAS

Province	<u>1939-1958</u>					
	1939	1945	1950	1955	1957	1958
Ontario	32	45	31	40	40	42
Quebec	46	35	60	55	51	49
Atlantic Provinces	<u>22</u>	<u>20</u>	<u>9</u>	<u>5</u>	<u>9</u>	<u>9</u>
	100	100	100	100	100	100

Source: Department of Mines and Technical Surveys.



CHART 12



SOURCE: MINERAL RESOURCES DIVISION  
DEPT. OF MINES AND TECHNICAL SURVEYS, OTTAWA

The recent decline in the relative position of Montreal is due to a rapid expansion of refining in Ontario, as this area has obtained access to Western Canada crudes through the extension of the Interprovincial pipe line system. However, despite this relative decline, the actual refining capacity of the Montreal area is expected to increase by at least 12 per cent in 1960.

The greater concentration in the past of the refining capacity of Eastern Canada in Montreal is a direct result of the accessibility of that area to waterborne foreign crudes, either directly or through the Portland-Montreal pipe line. For this reason Montreal has remained the largest refining centre despite the fact that Ontario has constituted the largest market in Eastern Canada for refined products. Because of the availability of comparatively low-cost crude from a variety of overseas sources, products refined in Montreal could be marketed as far west as the Toronto-Hamilton area in competition with products refined in Ontario from inland crudes originating for the most part in the Mid-Continent area of the United States. In recent years, however, the availability of western Canadian crudes through the extension into Ontario of the Interprovincial pipe line system has resulted in the expansion of Ontario refining capacity at a faster rate of growth than in Quebec. As a result, the Ontario refining industry has supplied an increasing share of a rapidly growing provincial product demand.

There is an appreciable difference in the pattern of product demand between Ontario and Quebec. For example, it will be seen from Table XXXI that, in comparison with Ontario, the demand for gasoline in Quebec is low, whereas the demand for heavy fuel oil is comparatively high. The refining operations of the two provinces have been developed on a complementary basis because of this diversity of demand.

TABLE XXXI  
PRODUCTION AND SALES OF PETROLEUM PRODUCTS  
IN EASTERN CANADA, 1958  
(millions of barrels)

	Refinery Production		Sales <sup>(b)</sup>		
	Quebec and Maritimes <sup>(a)</sup>	Ontario	Maritimes	Quebec	Ontario
Motor gasoline	30.27	24.33	6.70	19.03	34.74
Kerosene and stove oil	7.10	3.09	2.85	6.09	4.37
Diesel fuel oil	7.47	4.46	2.85	4.16	4.85
Light fuel oil	16.88	14.27	4.05	13.41	25.39
Heavy fuel oil	22.61	8.47	5.35	15.92	10.12

Notes: (a) Montreal refiners in Quebec account for about 85 per cent of this production, the Maritimes the remainder.

(b) The sales shown are net sales and do not include refinery consumption and losses.

Source: Compiled by Commission staff from data supplied by the Dominion Bureau of Statistics. (Preliminary estimate).

The refinery expansion which is taking place in Ontario will tend to make Ontario less dependent on Montreal output in the future. Should the pattern of product demand in Eastern Canada change appreciably this might also tend to lessen the traditional dependence of the Ontario market on Montreal refining production. Such a change in product demand might come about if natural gas sales have an appreciable effect on fuel oil sales in Ontario and Quebec. This would reduce the demand for light fuel oils, relative to gasoline demand, and make a light crude of 35° gravity more suitable for refinery operation than a heavier crude. On the other hand, continuing industrial expansion will require increasing quantities of light and heavy fuel oils.

It is not possible at this time to determine whether future changes in the pattern of demand will result in an extensive use of lighter gravity crude, such as Alberta crude, in place of the 31° gravity crude now being used in the Montreal refineries.

Table XXXII gives particulars of the refining companies in the Montreal area, including ownership, capacity and sources of crude oil.

TABLE XXXII

REFINERY CAPACITY AND CRUDE OIL IMPORTS AT MONTREAL 1957

Refining Company	Crude oil capacity (barrels per day)	Approximate imports (barrels per day)	Source	A.P.I. Gravity
Imperial Oil Limited	71,800	70,000	Venezuela	31°
Shell Oil Company of Canada Limited	60,000	30,000 30,000	Venezuela Kuwait	30.8° 31°
Texaco Canada Limited (formerly McColl-Frontenac Oil Company Limited)	59,000	34,800 3,000 19,000 300	Venezuela Trinidad Saudi Arabia U.S.A.	31° 31° 31°
The British American Oil Company Limited	45,000	43,000	Venezuela	31°
Canadian Petrofina Limited	20,000	16,000	Kuwait	31°
BP Refinery Canada Limited*	30,000			

\* Under construction.

Source: From submissions to the Commission.

The average gravity of the crude oil imported at Montreal in 1957 was 31° A.P.I. This type of crude has been preferred for the Montreal market because of the lower gasoline yield and the higher yields of middle distillates and heavy fuel oil than are customary from the average crude of 34° to 35° A.P.I. gravity produced in Western Canada.



Venezuela has been the main source of supply of crude oil for Montreal. Shipments from that country normally have constituted more than three-quarters of the annual crude oil requirements. Recently, as will be seen from Table XXXIII, there has been an increase in the use of Middle East crudes.

TABLE XXXIII  
REFINERY CRUDE OIL RECEIPTS AT MONTREAL, BY SOURCE  
1956-1958

	<u>1956</u>		<u>1957</u>		<u>1958</u>	
	millions of barrels	per cent	millions of barrels	per cent	millions of barrels	per cent
United States	-	-	4.0	4.5	0.1	0.1
Venezuela	66.5	76.3	69.5	78.6	55.1	64.5
Trinidad	1.2	1.4	1.0	1.1	0.2	0.2
Colombia	0.2	0.2	-	-	-	-
Iran-Iraq	1.1	1.3	0.3	0.4	0.4	0.5
Kuwait	6.3	7.2	7.5	8.5	17.2	20.1
Saudi Arabia	<u>11.9</u>	<u>13.6</u>	<u>6.1</u>	<u>6.9</u>	<u>12.5</u>	<u>14.6</u>
Total imports	87.2	100.0	88.4	100.0	85.5	100.0

Source: Compiled by Commission staff from data supplied by the Dominion Bureau of Statistics.

The value of crude oil imported into Quebec for use at Montreal refineries during the period 1956-1958, compared with the value of total crude oil imports into Canada, was as follows:

Year	Quebec Imports	Total Canada Imports
1956	\$223,387,787	\$271,290,793
1957	\$244,894,822	\$305,557,147
1958	\$221,168,099	\$278,541,000

For many years crude oils were imported into Montreal by tanker. Large storage facilities were required to offset the winter closure of the port. In 1941, as a war emergency measure, the Portland-Montreal pipe line was constructed with an initial capacity of 50,000 barrels per day. At the present time, as will be seen in Table XXXIV, the bulk of crude oil imported is trans-shipped from ocean tankers at Portland, Maine, and moved over the 236-mile Portland-Montreal pipe line system, which now has a capacity of some 253,000 barrels per day. Seventy miles of the system, which consists of an 18-inch and a 12-inch line, lie within Canada and the remainder is in the United States. Although crude oil still reaches Montreal direct by tanker, the proportion is relatively small and has been decreasing in relation to total deliveries.

TABLE XXXIV

CRUDE OIL RECEIPTS AT MONTREAL BY METHOD OF DELIVERY1950-1958

(millions of barrels)

Year	Via pipe line from Portland, Maine <sup>(a)</sup>	Tanker deliveries to Montreal harbour <sup>(b)</sup>
1950	27.0	14.6
1951	45.6	8.6
1952	49.8	5.1
1953	53.0	5.6
1954	53.3	8.4
1955	67.7	6.3
1956	76.8	10.4
1957	81.4	7.0
1958	78.5	7.0

Source: (a) Submission to the Commission by  
Montreal Pipe Line Company Limited.

(b) National Harbours Board Annual Reports.

The Montreal market is also supplied by imported products. These normally constitute 10 to 15 per cent of total oil supply in the Province of Quebec. They are, for the most part, delivered by tanker to Montreal. Whereas crude oil enters duty-free into Canada, the different petroleum product imports are subject to various rates of duty, averaging approximately 18 cents per barrel. The entry of these products into Montreal is a contributing factor in establishing the prices of products of the Montreal refineries.

Products manufactured in Montreal refineries reach markets in the Province of Quebec principally by rail and road, although some are shipped by tanker on the St. Lawrence River. Shipments to the Maritimes while relatively small have been mainly by tanker. The principal shipments to Ontario are made through the Trans-Northern products pipe line. This line extends 398 miles, from Montreal to Hamilton, with a 42-mile branch line to Ottawa from a point near Cornwall. The line has a capacity in the main Montreal-Toronto section of 80,000 barrels per day, having been increased from its initial 1952 capacity of 40,000 barrels per day.

The Commission received several estimates regarding the future growth of the Montreal refining centre. These were expressed in terms of crude oil requirements and were based on two assumptions, one being that Montreal would continue to be supplied by foreign crude and the other that it would be supplied by Canadian crude. The estimates, for the years 1962 and 1967, of the Oil and Gas Conservation Board of Alberta and of The British American Oil Company Limited are shown in Table XXXV.

TABLE XXXV  
CRUDE OIL REQUIREMENTS, FOREIGN AND DOMESTIC,  
OF THE MONTREAL REFINING CENTRE, 1962 AND 1967

(in thousands of barrels per day)

	Oil and Gas Conservation Board of Alberta	The British American Oil Company Limited
<hr/>		
Montreal supplied by foreign crude oil		
1962 - Crude oil imports	261	222.6
- Product imports	<u>20</u>	<u>65.4</u>
Total crude and products	281	288.0
1967 - Crude oil imports	331	283.8
- Product imports	<u>20</u>	<u>85.1</u>
Total crude and products	351	368.9
 Montreal supplied by Canadian crude oil		
1962 <sup>(1)</sup> Crude oil imports	51	-
- Western Canada crude oil	210	204.9
- Product imports	<u>20</u>	<u>81.5</u>
Total crude and products	281	286.4
1967 - Crude oil imports	71	-
- Western Canada crude oil	260	261.4
- Product imports	<u>20</u>	<u>105.6</u>
Total crude and products	351	367.0
<hr/>		

- (1) The Conservation Board forecast assumes that imports of products would continue at approximately the 1958 level, and that Canadian crude would meet 80 per cent of the crude requirements of Montreal refineries, i.e., 210,000 barrels per day of Canadian crude and 51,000 barrels per day of imported crude. The British American Oil Company forecast assumes that the deficit in the refinery yield of middle distillates and residual fuel oil arising from the use of light gravity crude from Western Canada would permit maximum refinery runs of 204,900 barrels per day to meet the expected gasoline demand, with the remaining oil requirements being met entirely by petroleum product imports.

Source: Submissions to the Commission.

On the assumption that Canadian crude will be marketed in Montreal the estimates made by the Oil and Gas Conservation Board of Alberta and The British American Oil Company Limited do not differ



appreciably. The differences arise from the relative importance attached to the import of foreign crude and products. These differences affect the anticipated level of refining operations in Montreal rather than the volume of Canadian crudes which the market might absorb. The estimated demand for Canadian crudes for 1962 is approximately 210,000 barrels per day and for 1967 is approximately 260,000 barrels per day.

#### Corporate Affiliations of the Refining Companies

Share control of all the companies having Montreal refineries is held, directly or indirectly, by international oil companies: Imperial Oil Limited by Standard Oil of New Jersey; The British American Oil Company Limited by Gulf Oil Corporation; Shell Oil Company of Canada Limited by the Royal Dutch-Shell Group; Texaco Canada Limited by Texaco Inc.; Canadian Petrofina Limited by Petrofina, S.A. and BP Refinery Canada Limited by the British Petroleum Group, through The British Petroleum Company of Canada Limited. All of these international companies, with the exception of Petrofina, S.A., directly or indirectly control large reserves in the Middle East. Apart from the British Petroleum Group they also control substantial reserves in the Caribbean. Standard Oil of New Jersey, Gulf Oil Corporation, the Royal Dutch-Shell Group and Texaco Inc. have an estimated 87 per cent interest in total Venezuela crude oil production.

Each Montreal refining company has well established arrangements for supplies of crude oil, principally from companies within the control of its majority shareholder. In the case of Canadian Petrofina Limited, the Commission was informed that Petrofina, S.A., although having no reserves in the Middle East, had agreed to guarantee a supply at competitive

prices. The Montreal refining companies are, therefore, in a position to obtain crude oil supplies from the principal producing areas of the world. By reason of the fact that, in general, international affiliates supply these refiners at their posted prices, shipments into the Montreal market have seldom reflected the low prices of "distress" oil.

The five companies currently operating refineries in Montreal owned or controlled approximately 80 per cent of Canadian refining capacity at the end of 1957 and are comparatively large owners of oil reserves in Western Canada. In 1957, these companies produced some 78 million barrels of Canadian crude or about 43 per cent of total production in Canada. This would be equivalent to 90 per cent of the crude oil imported into Montreal in that year. The companies have rights covering more than one-half of the proved crude oil reserves in Western Canada and certain of them have large investments in both the Interprovincial and Trans Mountain pipe line systems. As a group they would benefit from the increase in production resulting from access of Canadian crude to the Montreal market to the extent of a very substantial percentage of the enlarged production, because of the high degree of shut-in capacity in the fields where they are major reserve holders. On the other hand, they would not share equally in such a production increase because two of the companies control approximately 75 per cent of the present annual production of the group in Western Canada. Those companies with large investments in pipe line facilities would also benefit from their increased use.

Tanker transportation arrangements vary among the different refining companies in Montreal. Some companies own tankers which transport part of their supply of foreign crudes, while others use tanker facilities provided by parent or affiliated companies or by charter-party. One refining company has two tankers under charter-party: one terminating in 1965 and the other in 1974. All other charter-parties, in respect

of which testimony was given to the Commission, expire not later than 1962. Although there is considerable variation in the rates secured under the different tanker arrangements, over any period of time such transportation costs of crudes imported into Montreal generally reflect the more stable costs of company-owned or chartered tankers, rather than the more widely fluctuating transportation costs of "spot" tanker shipments.

The five companies operating refineries in Montreal are the sole owners of the Portland-Montreal oil pipe line. The Trans-Northern products pipe line is owned by The British American Oil Company Limited, Texaco Canada Limited and Shell Oil Company of Canada Limited. Imperial Oil Limited does not use this line. Canadian Petrofina Limited makes shipments through it under arrangements made in 1953 for a period of three years and since extended until 1962.

Pipe Line Proposals for the Transportation  
of Western Canadian Crude to Montreal

The size of the market for crude in the Montreal area, in relation to potential Canadian production, is sufficient reason to consider the feasibility of transporting Canadian crude to Montreal. Several companies have reviewed the question a number of times in the past few years. However, the marketing difficulties faced by the industry in late 1957 increased the interest in this possible market for Canadian crude. A detailed pipe line proposal was put before the Commission by a group of companies under the leadership of Home Oil Company Limited. This proposal was changed and further developed and at later hearings was presented on behalf of Independent Pipe Line Company, which became the spokesman for the Home Oil group. Interprovincial Pipe Line Company also submitted its views and gave the Commission information as to how its line could be extended to Montreal. Canadian Bechtel Limited, at the request of the Commission, made a review of the various proposed routes and costs involved.

Home Oil Group and/or Independent Pipe Line Company

As a result of engineering studies, a route, following, in general, that of the Interprovincial Pipe Line Company from Alberta to northern Michigan, thence crossing into Canada at Sault Ste. Marie and going directly to Montreal, was selected as the most economical by the Home Oil group and the Independent Pipe Line Company.

In the first presentation of the proposal by the Home Oil group throughputs had been based on deliveries in Montreal only. As a result, a pipe line of 30-inch diameter was considered as the most economical size. In a later presentation by the Independent Pipe Line Company estimated throughputs were increased to take care of part of the Ontario demand by deliveries to Interprovincial Pipe Line Company at Superior and later by a new line from North Bay to the Toronto refinery area. The revised proposal, to which subsequent discussion in this report is confined, envisaged a 36-inch diameter line from Edmonton to Superior and a 34-inch line from Superior to Montreal.

The total length of the line from Edmonton to Montreal would be 2,020 miles, with about 40 per cent of its length in the United States. Estimates of throughputs assumed that the pipe line during its first full year of operation would serve 70 per cent of the Montreal demand or, according to the Independent Pipe Line Company, 224,000 barrels per day in 1961. This throughput, it was felt, would increase to 402,000 barrels per day or 85 per cent of the estimated demand by 1970. The estimated throughput also assumed deliveries to the Interprovincial pipe line system, as mentioned above. In consequence, initial total throughputs from Alberta were estimated at 253,000 barrels per day in 1961 and 718,000 barrels per day in 1970. The initial cost of this line was estimated at \$370 million, increasing by 1970 to \$414,553,000.



It was claimed that a line such as that proposed would effect all the economies of a modern, large-diameter pipe line. The Montreal market was large enough to support a large-diameter pipe line. Furthermore, a high load factor could be assumed because a gradual build-up of the market would not be necessary if the Government took steps to restrict the import of foreign crudes. Cost calculations were therefore made on the assumption of a 98 per cent load factor. The calculations of the cost of service of the pipe line included depreciation, interest, operating costs, return on investment and income taxes. It was estimated that the cost of service from Alberta to Montreal, assuming a growth of throughput as mentioned above, would be 72.7 cents per barrel in the first year of operation, decreasing to 48.1 cents per barrel in the fourth year, with further reductions as the throughput increased. It was indicated that these estimated costs did not allow for variations in refinery demands due to seasonal factors, unforeseeable competition in serving the areas considered and temporary fluctuations in the growth of markets.

An essential feature of the cost analysis presented by Independent Pipe Line Company was that the estimated revenue for each of the first 10 years was calculated on the basis of the cost of service during the fourth year of operation. This method of calculation enabled the Company to suggest the possibility of relatively low transportation charges during the initial years. The Company considered such a plan to be a sound commercial proposal which could be financed if appropriate throughput agreements were entered into by the Montreal refining companies.

#### Interprovincial Pipe Line Company

Interprovincial did not present detailed proposals with respect to a proposed pipe line to Montreal. It did emphasize, however, that it considered its present line a modern low-cost line, which could not be

replaced by a new single 30-inch line, with adequate pumping stations, at anything like the actual cost of the present facilities. Interprovincial emphasized the advantages it felt it had over any other company which might want to build a line to Montreal: it could use part of its present facilities; it would be in a better position to finance the project than a completely new company and it would have greater flexibility than a new direct line from Alberta to Montreal, as it had access to sources of crude from all over Western Canada and made deliveries at a number of points along its system.

The Company informed the Commission that its preliminary studies suggested that Canadian crude oil could be delivered to Montreal through an extension of its system, by means of a further 26-inch line running from Sault Ste. Marie to Montreal, at a tariff of about 70 cents per barrel, if a throughput of 150,000 barrels per day were guaranteed. This tariff might be reduced as volumes increased over the years. Subsequently the Company indicated that further investigations had confirmed that the Sault Ste. Marie route was the most favourable one and that it could deliver 200,000 barrels of crude oil per day to Montreal, within one year, at a capital cost of \$150 million. This could be done by accelerating the present expansion programme of the Company and by constructing a 30-inch line from Sault Ste. Marie to Montreal. At the same time, it would be able to supply the Ontario market with a further 100,000 barrels per day, with an additional capital expenditure of \$116 million.

Interprovincial claimed that the transportation tariff on its expanded system would be comparable to that of any other system if volume, guarantees of throughput and rates of return were similar. To achieve minimum tariffs, capital expenditures would have to be kept to a minimum and throughputs would have to remain close to the capacity of the system.

The Company argued that the best approach to achieve low-cost transportation of Canadian crude to Montreal was a step-by-step construction programme, in line with market demand and long-term objectives, avoiding the building of facilities which might not receive maximum use for some years.

Canadian Bechtel Limited

Canadian Bechtel Limited, at the request of the Commission, prepared a study of alternative methods of transporting Canadian crude oil to Montreal by pipe line. In making this study, the Company recognized that so many variables could be considered that the study would be too complex and the presentation too complicated unless it held to a definite pattern. It decided that the most realistic approach was to prepare the report exactly as if it were being prepared for industry. Accordingly the report was prepared as a standard commercial yardstick against which the Commission could measure the economics of a pipe line to Montreal. Two basic transportation methods were considered: a new direct line and an expanded Interprovincial pipe line system.

For a new direct line three possible routes were considered by Canadian Bechtel Limited: firstly, an all-Canadian route approximately along the route of the Trans Canada gas pipe line; secondly, a route via Sault Ste. Marie and across northern Ontario direct to Montreal, and thirdly, a route approximately paralleling the Interprovincial pipe line to Toronto and continuing to Montreal. Its analysis showed that the line through Sault Ste. Marie, which is similar in location and total mileage to the routes considered by Independent Pipe Line Company and Interprovincial Pipe Line Company, would be the cheapest. Canadian Bechtel estimated that the capital cost of a 30-inch diameter line following this route, having a design capacity of 300,000 barrels per day and capable of an average throughput of 255,000 barrels per day,

would be \$344,910,000. It further estimated that this line would give a unit cost of transportation of 73.9 cents per barrel from Edmonton to Montreal for the first year of operation. The unit cost of transportation would, of course, increase for lower average throughputs and it was estimated that there would be a unit cost of 81.5 cents per barrel, for an average throughput of 212,500 barrels per day for the first year of operation, for a 30-inch diameter line having a design capacity of 250,000 barrels per day.

The estimated unit cost of transportation of 73.9 cents per barrel for the initial year was calculated by Canadian Bechtel Limited from annual transportation costs made up as follows:

Operation	\$ 8,358,000
Depreciation	11,858,000
Amortization of financing expense	204,000
Interest	12,934,000
General Taxes	3,388,000
Income Tax	15,068,000
Net Income	<u>16,991,000</u>
Total	\$68,801,000

Canadian Bechtel Limited also examined the cost involved in extending the present Interprovincial pipe line system from Toronto to Montreal. It considered that such an extension, taking into account the reserve capacity in the system, would require a new pipe line section covering the 345 miles between Toronto and Montreal, in addition to some pipe line looping and further pumping capacity in the present system. It estimated the transportation cost from Edmonton to Montreal on this system would be 69.1 cents per barrel for an average throughput of 255,000 barrels per day, 69.4 cents for 212,500 barrels per day, 74.7 cents for 170,000 barrels per day, 76.0 cents for 127,500 barrels per day



and 66.6 cents for 85,000 barrels per day. These were estimated costs for the first year of operation. The capital cost of new facilities for the expanded system, as estimated by Canadian Bechtel, ranged from \$79,928,000 for a throughput of 85,000 barrels per day to \$290,022,000 for a throughput of 255,000 barrels per day but the effect of the existing reserve capacity and the cost of the additional pumping and looping on the existing line was found to be different for each of the average daily throughputs. As a result, the estimated transportation cost per barrel from Edmonton to Montreal was less for a throughput of 85,000 barrels per day than for 127,500 barrels per day and, for larger volumes, the decrease in the cost per barrel was not in direct proportion to volume increases.

Table XXXVI sets out the cost estimates relating to the four alternative routes included by Canadian Bechtel Limited in its study, based on identical average daily throughputs of 255,000 barrels.

TABLE XXXVI  
COST DATA ON ALTERNATIVE PIPE LINES  
EDMONTON TO MONTREAL  
(First Year Costs)

	Distance	Total cost	Cost of transportation per barrel
Expanded Interprovincial Pipe Line System	2,245*	\$290,022,000	69.1¢
All Canadian route	2,100	\$395,335,000	83.9¢
Via Sault Ste. Marie	2,060	\$344,910,000	73.9¢
Parallel to Interprovincial Pipe Line System	2,245	\$368,363,000	78.8¢

\* Total length of system; the extension from Toronto to Montreal would require 345 miles of new line, plus looping on the existing line.

Source: Submission by Canadian Bechtel Limited.

Canadian Bechtel Limited reached the following specific conclusions in regard to a pipe line to transport western Canadian crude to the Montreal market:

1. "From an engineering standpoint there are no insurmountable problems involved in the construction or operation of an oil pipeline from Edmonton to Montreal.
2. If an entirely new pipeline system is to be built the most economical route parallels the Interprovincial line to Superior and thence goes eastward through Sault Ste. Marie directly to Montreal.
3. For the movement of average daily volumes of crude oil up to 300,000 barrels, transportation by an expanded Interprovincial system has an economic advantage over a new direct pipeline system. Based on the conditions and assumptions outlined in the report at an average daily volume of 255,000 barrels, the cost of transportation in a new direct pipeline will be 73.9 cents per barrel and 69.1 cents per barrel through the expanded Interprovincial system. At lesser volumes the economic advantage is even greater.
4. Construction of an entirely new pipeline system or a major expansion of the Interprovincial system would in our opinion require two construction seasons for completion."

Canadian Bechtel Limited pointed out to the Commission that the major differences between its estimates and those of the Independent Pipe Line Company arise from its adherence to conventional practices in the financing of oil pipe lines. In the opinion of Canadian Bechtel the procedures used by the Independent Pipe Line Company, on the other hand, followed more closely the practices in the gas pipe line industry. It pointed out that two conditions considered essential for the successful financing of gas pipe lines are a secure supply of gas and sales contracts to ensure market outlets. Supply is normally assured by purchase contracts, in amounts sufficient to provide for the amortization of the pipe line, supported by proven reserves dedicated to the pipe line by the regulatory authority. In addition to providing a secure supply and a dependable outlet, gas purchase and sales contracts also establish a long-term price at which the gas is purchased and sold. These conditions reduce

the risk in gas, as compared to oil, pipe line financing and permit a lower rate of return and a lower ratio of equity capital to funded debt, than is usual in oil pipe line financing. Such conditions have enabled gas pipe line companies to accept lower returns in the early years of operation by averaging profits over the first few years. A third condition tending to reduce the cost of service on gas pipe lines, as compared to oil pipe lines, is that for operational reasons a gas pipe line can be used at a higher load factor than can an oil pipe line. In its analyses Canadian Bechtel used a load factor of 85 per cent compared with one of 98 per cent used by Independent Pipe Line Company.

Canadian Bechtel Limited advised the Commission that if the financial risks of an oil pipe line from Alberta to Montreal could be made comparable to those of gas pipe lines, by creating conditions appropriate to an assured supply of oil as well as of markets, the estimated costs of service could be reduced by reason of the lower risks involved. Based on this assumption, the Company estimated that the unit cost of transportation on the line with an average throughput of 255,000 barrels per day would be reduced from 73.9 cents per barrel to 61.5 cents per barrel, for the first year of operation, and that during the fourth year of operation the cost would be reduced to 58.5 cents per barrel.

A comparison of the analyses made by Canadian Bechtel and Independent Pipe Line Company shows that Canadian Bechtel assumed funded debt to be 75 per cent rather than 85 per cent of total capital as assumed by Independent Pipe Line Company. Interest on debt was taken at 5 per cent by Canadian Bechtel compared with 5.25 per cent by the other Company. Canadian Bechtel based net income on a net return of 5 per cent on the cost of plant after payment of interest. This would

amount to a return of 8.75 per cent before payment of interest, compared with a 7.5 per cent return before payment of interest assumed by the Independent Pipe Line Company.

Obviously the rate of return on the capital invested in a pipe line will significantly affect the cost of service. A variation in the rate of return on investment of 1 per cent from the 5 per cent assumed by Canadian Bechtel would result in a change in unit cost of transportation of approximately seven cents per barrel from the figure of 73.9 cents per barrel noted above.

#### Government-Owned Pipe Line

It is apparent that methods of financing and interest rates play an important role in the determination of the cost of transmitting oil by pipe line. Estimates of transmission costs must also take into account the payment of income taxes. Such income tax payments, of course, enter the estimates as a cost and thus affect the anticipated return on the investment. Estimates of transmission costs also reflect a rate of depreciation based on normal financial procedures. This rate of depreciation may be somewhat higher than is required if the physical life of the line were the only consideration. These factors, together with an appreciation of the historic role of transportation facilities in creating and consolidating the Canadian economy, prompted the Commission to enquire whether or not it might be practical, by means of a publicly-owned line, to improve the competitive position of Canadian crudes in the Montreal market, without requiring an increase in the price of petroleum products to consumers in that area. Such a pipe line might be regarded as a transportation facility created to serve the national interest.



An all-Canadian route is the only one which would seem to be compatible with government ownership of the facility. Canadian Bechtel Limited was asked by the Commission to estimate the cost of transportation through such a pipe line and under date of October 1, 1958, advised as follows:

"We have prepared an estimate as you requested in your letter to me of September 24th of the capital and operating costs of transporting 200,000 barrels of oil from Edmonton to Montreal under the special financial conditions that you have stipulated. Those conditions briefly being:

- (1) That the capital cost be determined on the basis of following an all-Canadian route and assuming a throughput capacity of 200,000 barrels per day; and
- (2) That the operating costs be determined when assuming that the total capital cost is represented by funded debt at five percent interest with depreciation of two percent per annum and assuming no profit.

In preparing the estimate we have assumed that the line would operate at an average load factor of 85%. Further, we have assumed present day costs throughout the estimate.

When applying the special conditions that you stipulated we firstly analyzed a pipeline economically designed for 200,000 barrels average daily throughput, and a second case of a pipeline initially transporting 200,000 barrels per day but capable of being expanded to 300,000 barrels average daily throughput.

Under normal financing arrangements the first case would be served most economically by a 26" diameter pipeline, and the second case by a 30" diameter line.

The special financing arrangements that you have stipulated, however, of using abnormally low depreciation and making no allowance for income or income taxes affects the overall cost to such an extent that it becomes more desirable to invest additional money in the larger pipeline and thereby reduce the capital and operating expenses of additional pumping stations. Thus, under these special conditions a 30" pipeline would give the same transportation

cost as a 26" pipeline at 200,000 barrels average daily throughput. The throughput of the 30" line could be increased to transport 300,000 barrels per day.

The studies of this situation have brought us to the following:

- (a) We estimate that the initial cost of this 30" diameter pipeline would be \$380,000,000 based as mentioned on present day costs; and
- (b) Excluding income and income taxes, and with a depreciation rate of only two percent per year, a transportation charge of 49 cents per barrel would be sufficient to cover direct operating costs, interest and depreciation when transporting on the average 200,000 barrels per day through an all-Canadian pipeline from Edmonton to Montreal.

In conclusion, I should mention that as the basis of calculation you have asked me to use is not similar to a normal commercial approach, the conclusions reached are not directly comparable with estimates prepared for a normal type of development. I know you fully appreciate the differences, but when an engineer follows an unusual financial approach in estimating the cost of some process or act, you will understand how anxious he is lest the figure so prepared be used in some way in direct comparison with the estimated cost of the same process when using a normal financial approach."

The question of public ownership of such a pipe line, of course, involves considerations beyond the question of securing lower transportation costs to permit the Montreal market to be reached by Canadian crude.

Different Views on the Desirability  
of Marketing Canadian Crudes in Montreal

The Commission has endeavoured to summarize and interpret the relevant testimony given to it by those who advocated and by those who opposed the construction of an oil pipe line from Western Canada to Montreal and the use of Canadian crude in the Montreal refinery area. The order in which the various arguments for and against the proposal appear in this summary cannot be expected to reflect the different emphasis placed upon them by various parties appearing before the Commission. The summary and interpretation should not be construed as representing the views of the Commission.

Proponents' Views

The proposal of the Home Oil group with respect to the construction of an oil pipe line from Edmonton to Montreal followed extensive investigations. These included a report by Dutton-Williams Brothers Limited of Calgary, Alberta, entitled "Preliminary Engineering Report on Proposed Alberta - Montreal Crude Oil Pipeline" and a comprehensive study by W.J. Levy Inc., of New York, entitled "Market Outlets for Canadian Crude Oil: Problems and Prospects".

From their interpretation of these studies the Home Oil group contended that western Canadian crudes could be laid down in Montreal competitively with imported crudes. The group concluded that no other secure market outlets for Canadian crudes were likely to develop and that, in view of the magnitude of the marketing problems facing the industry, government support for the proposed pipe line to Montreal was warranted.

Inasmuch as it was contended that Canadian crude could be laid down in Montreal at prices competitive with those of foreign crude, the group maintained that the only action needed by the Government of Canada would be such as

would require the Montreal refiners to agree to take Canadian crude over the period of amortization of the line. It was conceded that throughput agreements with the Montreal refiners would be necessary to enable the pipe line to be financed. If such throughput agreements were forthcoming voluntarily it was felt that no specific government action would be necessary. However, because of the fact that the Montreal refiners have established sources of crude, produced in foreign concession areas by affiliates of their international parent companies, it was suggested that, in order to overcome this commercial interest and not because of competitive difficulties, the Government might have to establish a system of import quotas on crude. As prices would be competitive, import duties would not be needed. Subventions would not be required for the operation of the pipe line because it would be a commercial proposition once throughput agreements had been entered into by the refiners. It was conceded that it might also be necessary for the Government to establish quotas on the import of petroleum products in order to ensure the fullest possible use of Canadian crude in the Montreal refining area. Thus, while Government support would be needed, it was claimed that this would not mean extensive control over any phase of the industry.

Regarding alternative markets, the group contended that the import restrictions imposed by the United States prevented Canadian crude from reaching, in adequate volume, what had been called its natural markets in the United States. In addition, it was felt that the "commercial preference" of refining companies in the United States, for the use of crude produced by affiliated companies in foreign countries where they owned concessions, was a very material factor in preventing Canadian crude from reaping the full benefits of its geographic and competitive advantages. This preference would exist



even if United States import restrictions were to be lifted. Moreover, there was every indication that the influence of the import restrictions and of the "commercial preference" of the refineries was of a long-term nature and would still persist when the difficult marketing conditions resulting from the recession disappeared.

It was argued by the group that, unless markets other than those presently being supplied by Canadian crude became available, the future of the oil industry in Western Canada would be in jeopardy. The ratio of production to producibility would be kept at a low level. There would be a lack of incentive to continue to explore and develop Canada's oil resources. A continuing low level of production would seriously affect the producing sector of the industry. Revenue would not justify past expenditures and it would become more difficult to finance future expansion. The major companies, because of their ability to rely on capital generated within the parent company's group, could withstand these difficulties for substantial periods of time. The smaller independent companies which have played a vital role in the growth of the Canadian oil industry, especially in the wildcat drilling phase, would undoubtedly lose ground to the major integrated companies. They have no large resources of working capital but depend, to a large extent, upon short-term credit from the banks. With prolonged marketing difficulties this source of credit could be denied them.

While it was recognized that there would be an increase in demand in the domestic markets now served by Canadian crude, this would not be sufficient to resolve the industry's production and marketing difficulties. Only a substantial, new and secure market could provide material assistance in this respect. The Montreal refining area was the only satisfactory potential market available and this outlet could

provide for an increase of approximately 40 per cent in the production of Canadian crude. The growth of this market over the years would ensure a continuing high level of production for the industry and, because it could be made secure, was much more desirable than possible United States markets, even of the same magnitude. With such a market the industry could better plan its future expansion and development programme, secure in the knowledge that production would not have to be substantially reduced as a result of any action over which Canada could have no control.

It was suggested that consumer prices would in no way be affected as Canadian crude would be competitive in price with imported crudes and as the prices of petroleum products in Eastern Canada are not directly related to the price of crude oil used by the refineries but must, in general, conform to the prevailing prices of actual or potential imports of petroleum products. The price of Canadian crudes at the well-head would not be adversely affected because the prevailing system whereby such prices were established by reference to the laid-down cost of Illinois crudes at Sarnia would continue in operation. Changes in world prices are reflected in the cost of Illinois crude at Sarnia; consequently the use of Canadian crude at Montreal need not make well-head prices any more susceptible to changes in world prices than they were already. Thus, it was claimed, the Montreal market proposal would be beneficial to the producing sector of the industry without being detrimental to the eastern Canadian consumer.

Other arguments were put forward to justify the intervention of the Canadian Government. There would be important effects on employment. As a result of the expansion of production in Western Canada much of the unemployment that would result from what would otherwise be a levelling-off of production and of exploration and development would be avoided.

In addition to encouraging employment in the production sector, the implementation of the proposal would create employment in those sectors of the Canadian economy which provide the oil industry with goods and services. The construction of the \$350 million pipe line itself would also provide for the employment of Canadian labour and the use of substantial quantities of Canadian materials. The existence of the pipe line, it was suggested, could also lead to the development of refinery capacity in population centres now served by refineries in southern Ontario or Montreal, with a resulting stimulus to local industry as well as a reduction in the cost of petroleum products in such centres.

Another advantage, the group said, was that in replacing imports of crude oil into the Montreal refinery area by Canadian crude there would be a substantial saving of foreign exchange to Canada, estimated to amount to about one-quarter of Canada's merchandise trade deficit in 1956. It was claimed also that a pipe line to Montreal would lead to greater national security for Canada. The area served by the Montreal refining complex is highly industrialized and could experience great difficulties if the flow of foreign crude were to be interrupted at any time. By contrast, a pipe line from Western Canada would assure the Montreal area of a constantly available land-borne supply of crude oil and remove its continual dependence upon the availability of crudes imported from overseas.

Canadian Husky Oil Limited strongly supported the proposal to market Canadian crude in Montreal. Objection was taken to the contention that the United States is a natural and logical market for Canadian crudes, because United States producers are already facing restricted markets and, furthermore, Canadian crude is not competitive with other foreign crudes in that country, except in some border areas. This company believed that additional markets for Canadian crude could only be assured by the construction of a pipe line to Montreal and direct government action to restrict imports.

Another group of nine independent oil companies also appeared before the Commission under the leadership of Bailey Selburn Oil and Gas Company Limited. There were differences of opinion among the group but the general consensus, while difficult to summarize, appeared to be that the Montreal market should be entered if alternative outlets in the United States of a continuing and long-term nature could not be developed within a reasonable period of time.

The proposal to market Canadian crude in Montreal received strong support from the Alberta Government through Premier Manning. In the course of one of Mr. Manning's appearances before the Commission, he said:

"Analyses made for me by the staff of the Oil and Gas Conservation Board indicate that the expansion in the Ontario market and the re-establishment of export at its former level in the two United States markets (with reasonable growth provision) would bring about a market growth insufficient for an effective solution to the problem. I believe that the eastern two of these three market areas would assure producers in Manitoba and Saskatchewan a continued outlet for their crude oil due to their geographical locations, but the improvement in Alberta would fall far short of what is necessary to meet the situation. I have been advised that with these markets, Alberta producers could look forward to marketing in 1960 only approximately 49 per cent of the oil which could be produced under good engineering practice. I, therefore, conclude that not only from the viewpoint of Alberta but from the consideration of Canada as a whole, these proposals do not go far enough, and expansion of our market either into Quebec or further into the United States or both, is a necessity."

He also emphasized that the price to the consumer in the Montreal market should not be increased.

The Government of Saskatchewan held that it was preferable for Canadian oil to move to the greatest extent practicable to the nearest economic markets. It also expressed the opinion, however, that continued import restrictions in the United States might result in no outlet other than Montreal being available to the shut-in production of Canadian crude. If such were the situation any action to open the Montreal market to Canadian crude would be of material assistance.



The study made by W.J. Levy, Inc., of New York, to which we have already referred, stated this firm's views with respect to the Montreal market as follows:

"31. In sum, the Montreal market is not an obvious direction of expansion from a logistic point of view and it poses the more difficult problems even in the narrow context of competitive price relationships. If the possibilities of exports to the United States appear to be adequate to the future development of the Canadian oil economy, and the uncertainties attaching to market expansion in the United States are not too discouraging, then Canadian oil may reasonably await a future expansion of its export markets without actively seeking an outlet in eastern Canada.

"32. If, on the other hand, the uncertainties of the U.S. export market appear to inhibit the balanced development of Canadian resources, or the cost of waiting for expanded market opportunities in the United States is too high, then the Canadian producing industry might have to seek relief where its own national policies could prove effective. This would, in fact, mean a penetration of the Montreal market."

Mr. W.J. Levy, at the invitation of the Commission, appeared at its hearings in Calgary and gave his views with respect to the factors which must be considered in providing for the use of Canadian crude in the Montreal refinery area in their relation to the need for additional outlets for Canadian crude. He stated that Canada faced a severe problem with regard to market outlets for crude, that this had been aggravated by the recession but not caused by it and, in his opinion, would not end when the recession ended. He felt that the marketing problem for Canadian crude should be approached on an intermediate level and on a long-term level, bearing in mind that what could be done in the immediate future should be done in a manner that would not handicap the industry. He pointed out that any relief to the industry that required large new facilities would take one to two and one-half years to become effective and that, therefore, any immediate relief to the industry's marketing problem would have to be based on the use of existing facilities. He felt that the Montreal refiners might be induced or encouraged to arrange for larger volumes of Canadian crude oil going to the West Coast of the United States as a quid pro quo for the importation of foreign crude by these Montreal refiners. He felt that the prospects in the United States for large scale exports from Canada might well give a profitable outlet for Canadian crude. He also felt that in order that there might be an overall agreement between Canada and the United States

on a common oil market, it would be necessary that there be a common policy for Canada, the United States and other Western Hemisphere countries and that controls which the United States has already or may have to impose in the name of security would have to be considered by Canada also in the light of any such common policy.

#### Opponents' Views

The most vigorous and detailed opposition to the proposal to build a pipe line to Montreal at this time and to service that area with Canadian crude came from those companies which are refiners in Montreal, but other international companies, operating in Canada mainly as producers or as refiners in other areas, also opposed the proposal. The arguments presented varied in certain respects but there was a fair degree of unanimity on the major points. The Montreal refiners made it clear that they believed Canadian crude could not be laid down in Montreal by normal commercial means at prices competitive with those of foreign crudes. This was a major point of contention on matters of fact. It was argued that the pipe line proposal was not realistic because the minimum cost of transportation to Montreal would be in the neighbourhood of three cents per 100 barrel miles or a minimum of approximately 60 cents per barrel, at which rate, assuming no reduction in field prices, Canadian crude in Montreal could not compete with foreign crudes. They pointed out that the laid-down cost of foreign crudes at Montreal was lower than that assumed in the calculations submitted by the Home Oil group and that this group had used for their price comparison a crude of a gravity similar to that of western Canadian crude, although crude of such gravity was not used in any appreciable quantity by Montreal refiners. Instead, the Montreal refiners processed crudes of lower gravity which were cheaper in price and better suited to the type of product demand in the Montreal marketing area.

The Montreal refiners contended that in purchasing Canadian crude they would be subjected to a number of disadvantages in their refinery operations. They would have to sacrifice the flexibility of supply with respect to their raw material without having the assurance of price protection for their products. Increases in import tariffs

on petroleum products would be needed to ensure that the Montreal refiners would maintain their present competitive position in regard to products from overseas, thereby penalizing the consumer in Eastern Canada. The Montreal refiners agreed with the Home Oil group that no serious technical problems were involved in processing Canadian crude in Montreal refineries although some modifications might be necessary. However, for some of the Montreal refiners, with equipment specially designed to process medium gravity sour Middle East crudes, a dependence on Canadian crude would necessitate the write-off of substantial amounts of capital equipment.

Certain other facilities serving the Montreal refinery area would have to be taken into account. These would include the tankage and wharfage facilities in the Montreal harbour, the Portland-Montreal pipe line, company-owned tankers and tankers under charter. It was estimated that the cost of abandoning the Portland-Montreal pipe line would be the equivalent of a seven cents per barrel charge added to the laid-down cost of Canadian crude at Montreal. Montreal refiners, as shareholders in Montreal Pipe Line Company Limited and Portland Pipe Line Company, are guarantors of the long-term indebtedness of the two companies. This amounted, as at March 31, 1958, to \$1,714,157 in Canadian funds and \$6,796,666 in United States funds. At par of exchange and allowing for the offset of existing working capital in the pipe line companies against this debt, the ultimate claim would be \$6.7 million. To this would be added the cost of the shareholders' investment. One of the Montreal refiners, which has an 18 per cent interest in the long-term indebtedness of the two pipe lines, advised the Commission that the actual cash loss which would be reflected in its accounts, if the Portland-Montreal pipe line were to be shut down completely, would amount to approximately \$1,750,000. This amount



includes the cost of its investment as a shareholder together with its obligation as a guarantor of long-term indebtedness.

Strong objection was taken by the Montreal refiners to the contention that a "commercial preference" for foreign crude was a factor in their opposition to the proposal. They asserted that companies operating refineries in Montreal conduct their business as Canadian companies. While admitting that they normally purchased their crudes at posted prices, mostly from affiliated companies owning concessions in foreign countries, they declared that if lower prices were offered by other producers such offers would be accepted, if consistent with normal deliveries. They argued that government action of some kind would be required to enable Canadian crude to be marketed in Montreal, that this would adversely affect the economics of the industry and that such action was not desirable at this stage since better alternative markets were available. Government support of the proposal, they declared, would be unwise and unwarranted. Instead, the Canadian Government should continue to press the United States Government for exemption of Canadian crude from import controls in order to facilitate the expansion of export markets for Canadian crude in the United States.

There was general agreement that the oil industry in Canada had to make readjustments. It was contended by the major companies, however, that many of the factors causing the low level of production were not basic, but of a cyclical nature, and would have only temporary effects. After such temporary difficulties were overcome, a healthier situation would develop provided the Ontario market could be saturated with Canadian crude and the export markets, principally those in the Puget Sound area, could be expanded. This, they admitted, would require a concerted effort by the industry and action by the Canadian Government insofar as markets in the United States were



concerned. The Puget Sound market, it was felt, could be regarded as an assured market for Canadian crude in due course. In Ontario, substantial market expansion was possible because the demand for products in the area would continue to grow at a rapid rate; expansion in refinery capacity was already taking place and imports of foreign crude had been reduced and perhaps could shortly be completely eliminated. As refinery capacity grew, the Ontario refineries would produce a larger share of the products used in the Province, with the result that shipments made by the products pipe line from Montreal could be reversed. This last step, they stated, had, in fact, been planned by the oil companies owning the Trans-Northern products pipe line to take place in 1962 and any company that had indicated an interest in shipping products over the line had been so advised.

Assuming a moderate growth in export markets and the saturation of the Ontario refinery market by Canadian crudes, the integrated oil companies felt that the industry should be able to produce at a rate of 50 to 70 per cent of producibility, the latter being as high a ratio as the industry has experienced in the past. It was claimed, however, that this ratio is not a satisfactory yardstick by which to appraise the health of the industry. A more significant measure, it was argued, is the ratio of remaining reserves to annual production.

It was submitted that the prospects for the industry were not as gloomy as was indicated by the group of independent producers. Furthermore, it was not the independents but the integrated oil companies who suffered most from a low level of production, since they owned most of the "shut-in" capacity. A more balanced development of the industry could be helped by changes in provincial regulations to bring about a somewhat slower development of leased acreage and wider well spacing, thus

reducing replacement costs. Similarly, changes in the method of calculating the minimum well allowance could be made so as to give greater recognition to efficient producing wells, rather than to marginal producers. The Government of Alberta felt that the significance of these latter factors had been exaggerated.

Objection was taken by the major companies to the suggested use of government controls to gain entry into the Montreal area for Canadian crude. It was argued that controls would lead to more controls and deprive the industry of the flexibility with which it has operated. Import quotas would have to be applied against crude imports, against the shipment of products from Maritime refineries, which would still operate on foreign crude, and against product imports. A system of import quotas might be workable but would create serious administrative difficulties. Tariffs on imports would be easier to administer but were not likely to be effective or suitable. Import duties would presumably apply to imports into the Maritime Provinces, even though it was not proposed that refineries in the Maritimes should utilize Canadian crude. In addition, the tariff method of restricting imports would lack the flexibility required to meet changes in world prices. A more direct method of achieving the objective would be to pay government subsidies to refineries equal to the difference between the laid-down cost at Montreal of Canadian and foreign crudes. However, the amount of subsidy needed would vary from time to time and become the subject of dispute between the various interested parties. To give direct subventions to a fast-growing industry might well provoke a public reaction in favour of further intervention in the affairs of the industry, including the control of profits.

Thus the attempt of the producing industry to improve its position for the short term might well cause it to become so involved in various government controls that it would lose some of the more

permanent gains which would otherwise accrue under a completely free system. Moreover, government support in the initial stages might not suffice to make the project self-sustaining over the period required to depreciate the pipe line, because subsequent changes in government policy might have the effect of withdrawing such support, thereby penalizing the project. Another result of government action to isolate the Canadian industry from the competition of foreign crude would be, the refiners claimed, to deprive the consumer of the benefits of actual or potential foreign competition with respect to product prices.

The entry of Canadian crude into Montreal with government assistance, it was argued, would also create serious problems for the producers. If the competitive prices of overseas crudes in Montreal were to determine field prices in Western Canada, field prices would have to be reduced appreciably. The result would be a writing down of the value of existing and future reserves. In such circumstances there might not be an adequate incentive to the industry to find and develop the new reserves required to supply this additional market. Such new reserves would have to be equivalent to the total of today's proved reserves in order to sustain the pipe line for a period of 30 years. A careful appraisal of future replacement costs would be necessary to determine whether or not the increased volumes of production resulting from the Montreal market would compensate the producers for any reductions in field prices that might be necessary. Moreover, the rapid development of additional reserves needed to supply the Montreal market, in addition to an increased demand in existing markets, would probably raise replacement costs, thus increasing the likelihood of a decline in returns to producers.

It was argued that, apart from the current competitive disadvantage of Canadian crude in Montreal, the competitive position of Canadian crude

in the Montreal market would probably deteriorate in the course of time due to basic competitive cost advantages of these foreign crudes. The refining companies felt that they could not underwrite a pipe line to Montreal, thus committing themselves to the long term use of Canadian crudes, without reasonable assurances that these crudes would be kept competitive with alternate sources of supply. Thus, producers, it was argued, would be obliged to commit their crude to a market exposed to the most competitive crude sources in the world, during which period of commitment other more economically situated markets (i.e. in the United States) might well become available in increasing volume. It was also argued that if Canadian crudes were marketed in Montreal under these circumstances, it might not be possible for Canadian crude prices to continue to be based on the price of Illinois crudes at Sarnia. This difficulty would arise because the price of Canadian crude at Sarnia, an inland location, is less directly influenced by the level of world prices than it would be at a seaboard location like Montreal. In addition, United States import restrictions provide a degree of insulation from world prices for the Illinois crudes which determine the price of Canadian crudes at Sarnia.

In addition to the imposition of import restrictions to protect the Montreal market for Canadian crudes, the Montreal refiners suggested that, if the pipe line proposal were accepted, the Government might be obliged to give a direct guarantee to the pipe line bonds in order to ensure that the project could be adequately financed. Most of the companies stated that, in the circumstances prevailing at the time, they would not voluntarily enter into throughput agreements to ensure the construction of a pipe line to Montreal.

Apart from the harmful effects on the industry itself, the major companies claimed government support of the entry of Canadian crude into Montreal by artificial means would be of doubtful benefit



to the Canadian economy as a whole. A policy which could result in an increase in the cost of energy would not be in the national interest. An energy policy which gives the consumer the choice of the energy source most suited to his need, at the lowest price possible, can best be attained when energy resources are developed by private enterprise, with a minimum of government intervention. The Government, they suggested, should also be wary of the supposed benefits accruing to the balance of payments from the elimination of imports of crude oil. It is to the country's benefit to minimize its energy costs, even if this requires some imports, and to pay for those imports by the sale of commodities which can be produced in the country at low cost. Government action to secure the Montreal market for Canadian crude, it was stated, would raise many complex issues in the matter of international trade policy. New trade barriers would conflict with Canada's obligations under GATT and might also result in substantial dollar losses for the sterling area. The matter of national security, it was suggested, is more complex than had been indicated by the proponents of the project. On the military aspect itself, a variety of opinions might be held in view of changing strategic concepts and the possible need for the decentralization of refinery capacity and of industry. If the entry of Canadian crude into the Montreal market had the effect of reducing the attractiveness of the industry for investment, as might well be the case, a weaker industry would result to the detriment of Canada's ultimate security.

Competitive Position of Canadian Crude in Montreal

The differences of opinion on the economic feasibility of using Canadian crude oil at Montreal indicated the necessity of determining the cost of overseas crude oils to the Montreal refining companies. During its hearings the Commission received a number of estimates from the Montreal refiners with respect to the laid-down cost of foreign crude at Montreal. Computations were made for the most typical qualities of overseas crude imported, taking into account posted prices, transportation costs (including tanker costs), insurance and the transportation tariff on the Portland-Montreal pipe line, and adjusting the results from United States to Canadian dollars. These laid-down costs represented, in effect, individual company opinion of the industry's average cost experience. The actual cost of imported crudes to the Montreal refineries was not in fact represented by the estimates although indications were given that the variation might not be very great. These company estimates, at the time of the hearings, ranged from \$2.86 to \$3.14 per barrel (Canadian funds) for all sources of crude, with the range for Venezuela crude being somewhat narrower at \$3.07 to \$3.14 per barrel. A weighted average of these estimates on the basis of the crude oil supply situation in Montreal for 1957 would suggest an average laid-down price of about \$3.08 per barrel.

To acquire more precise information, the Commission requested from each of the Montreal refiners certain particulars concerning the laid-down cost in Montreal of crude oil for the month of December, 1958. These particulars indicate that western Canadian crude oil would have been at a competitive disadvantage of 25 to 35 cents per barrel at Montreal in December, 1958, if the pipe line tariff or costs appearing in the estimates of Canadian Bechtel Limited, in the order of 70 cents per barrel for the first year of delivery, were assumed. If the pipe line costs estimated by Independent

Pipe Line Company are used, amounting to approximately 50 cents per barrel on the basis of fourth year cost of service, the competitive disadvantage would be in the order of 5 to 15 cents. These calculations do not make allowance for costs involved in any transition to the use of Canadian crudes, such as those arising out of the abandonment or a reduction in the level of operations of the Portland-Montreal pipe line, or possible losses associated with other investments, such as wharfage facilities or tanker commitments. On the other hand, they do not take into account any premium which might be accorded to Canadian crudes due to their relatively high A.P.I. gravity compared with the majority of crudes imported into Montreal.

As noted previously, decreases in world prices in February, 1959, brought reductions for the type of crude used in Montreal of 15 cents per barrel for crude from Venezuela and 18 cents for crude from the Middle East. Pipe line rates to Toronto via the Interprovincial pipe line were reduced and a reduction in the field prices of Western Canada crude also occurred. However, these changes do not materially affect the conclusion reached regarding the competitive disadvantage of Canadian crude in Montreal on the basis of its laid-down cost at the end of 1958.

The further price reduction in Venezuela in April, 1959, equivalent to about 10 cents per barrel in the laid-down costs of these crudes in Montreal, has not been followed as yet by any change in the posted prices of crudes in the Middle East or in Western Canada. Thus Canadian crudes in mid-1959 would appear to be at a theoretical disadvantage of approximately 35 cents, if pipe line transportation costs of 70 cents per barrel are assumed or approximately 15 cents if pipe line transportation costs of 50 cents per barrel are assumed.

These pipe line transportation costs are based on a number of assumptions, each of which will require examination in the light of the circumstances which prevail when decisions are called for with respect to any particular project. For example, at this time it would seem that the volumes of throughput assumed in the calculations, except those associated with a government-owned line, are somewhat higher than might be absorbed by the Montreal market in the immediate future. The market estimates presented to the Commission suggest that the crude oil requirements of the Montreal refineries will be approximately 210,000 barrels per day in the early 1960's. This compares with 255,000 barrels assumed in the cost calculations. The Montreal refineries have sufficient capacity to process more crude oil than the forecast requirements of the market but to refine much more than 210,000 barrels per day of Canadian crude would probably require them to ship the surplus supply of refined products back into the Toronto area. This would involve them in competition with the Ontario refineries. However, assuming that Canadian field prices had to be reduced to enable Canadian crudes to be marketed in Montreal, such reductions would be reflected in the Toronto refinery area as well as in Montreal, thereby giving the Ontario refineries a cost advantage over the Montreal refineries. Presumably it would not be feasible, therefore, for the Montreal refineries to dispose of the probable surplus of products in this manner. Consequently it may be concluded that the Montreal refineries would probably not require the volume of Canadian crude oil assumed in most of the pipe line cost estimates until about 1967. Most of the estimates of pipe line transportation costs presented to the Commission may, therefore, prove to be too low.



It is possible that prospective developments associated with the movement of liquefied petroleum gases produced in oil and gas fields of Western Canada or fuel oils derived from the Athabasca oil sands may lead to the need for an enlargement of pipe line transportation facilities to Eastern Canada. If this were associated with plans for new pipe line facilities to supply crude oil to refineries in both Montreal and Toronto, the increase in volume of throughput resulting from the addition to the pipe line stream of fuel oils and liquefied petroleum gases could improve the economics of a pipe line to Montreal.

It is difficult to assess the possible competitive position of Canadian crudes in the Montreal market in the immediate future. Posted prices of overseas crudes may become more stable after the recent adjustments in world prices or these may be harbingers of further reductions. Ocean tanker rates are at an exceptionally low level at the present time and the level of these rates is important in determining the laid-down cost of foreign crudes in Montreal. The laid-down costs of Venezuela and Middle East crudes in December, 1958, reflected tanker rates in the neighbourhood of USMC minus 40 or lower. The possibility of a change in tanker rates within the next few years was discussed in Chapter 4. It should be noted that a change of 10 percentage points in the USMC rates would add or subtract some 18 cents per barrel to the cost of Middle East oils in Montreal and some four cents for Venezuela oils.

The addition of a market of perhaps 200,000 barrels per day, represented by the added demand of the Montreal refineries, would

represent an increase of about 40 per cent over the present level of production in Canada. In the normal course of events, the addition of this market to those already served by the Canadian industry would involve increased reserve requirements and could thus be expected to give rise to a substantial increase in the level of exploration and development in Canada. An important consideration, however, is not only the size of the market but its profitability. The extent to which well-head prices would have to be reduced to reach the Montreal market would also determine, in part, the degree to which it would serve as a stimulus or discouragement to exploration and development.

The effect of lower well-head prices on prospective profits, and thus on the incentive to develop further oil reserves, is illustrated in a study prepared by Imperial Oil Limited designed to show the effect of hypothetical reductions in well-head prices of 25 and 50 cents per barrel. The study showed that, on the assumption of a field price of \$2.52 per barrel (the price of Redwater crude in 1957), the future worth of the profit margin, after tax, would be 81 cents but would decline to 64 cents in the event of a reduction of 25 cents in that field price. The net rate of return, depending on the life of the wells and after allowing for a six per cent return on present investment, would then range between 6 and 9 per cent as compared with a range of 7 to 12 per cent if field prices were to remain at \$2.52 for the next 20 or 30 years. A reduction in well-head prices of 50 cents per barrel would reduce the future worth of the profit margin, after tax, to 46 cents and the probable rate of return to a range of 4 to 7 per cent which is, the Company declared, in some cases "actually less than the normal borrowing rate and would not pay the interest costs for the small operator". These calculations are based on average industry costs and, of course, are subject to wide

differences between companies and fields. Furthermore they do not make provision for the compensating advantages of an increase in the volume of production. The additional output of some 200,000 barrels per day would obviously serve as an important offsetting factor in these calculations. Among other things the higher production level, by shortening the period needed to repay the capital invested in established reserves, would tend to lower the cost structure of the industry.

The major oil companies on the basis of their forecast of the increased demand in established domestic markets and in export markets were of the opinion that exploration and development would have to be maintained at approximately the same level as that of the past few years in Canada. It was pointed out that increased markets for natural gas as well as the growth of demand for crude oils would tend to maintain this level of investment. They expressed concern that the addition of the Montreal market, together with maximum potential exports to the United States, would confront the industry with the problems associated with a very rapid rate of development. In extreme circumstances, they stated, this might require a level of exploratory drilling twice as high as the 1958 level. While an expansion of production tends to reduce costs, due in large part to the shortening of the time over which the original investment in reserves is recovered, a sudden necessity greatly to intensify exploration and development, it was pointed out, can have the effect of raising finding costs.

Reference was made in Chapter 4 to the improvement in the ratio of production to productive capacity which might be achieved with the growth of domestic and export markets. It is questionable, however, whether access to the Montreal market would permanently eliminate the continuing problem of surplus capacity in the oil producing industry

of Western Canada. The methods used to regulate the exploitation of oil-bearing lands have a direct bearing on this problem and these are a matter of provincial jurisdiction.

The strong encouragement which some provincial land policies give to oil exploration and development encourages excess productive capacity. These policies are intended to serve other and quite legitimate aims but they can have the effect of continuously forcing the pace of exploration and development. The levels of replacement costs in Western Canada also tend to be higher than they would otherwise be as a result of the practice of giving all producers a share of the available market. In other industries competition tends to eliminate high-cost production and thus to reduce excess production capacity. The understandable concern of provincial governments to ensure the widespread ownership of mineral-bearing lands, the rapid development of new production and the granting of a proportionate share of the market to all producers can contribute to high-cost production.

The methods under which lands are offered for reservation and lease have the effect of requiring producers to develop a field within a given period, even though the current level of production capacity may be greatly in excess of market demand. Prorationing arrangements encourage the development of new reserves by giving the newcomer to the industry, among others, a market allowance at the expense of the allowance formerly given to existing wells. Because the total market requirement has to be allocated among all producing wells and every well is given a minimum production allowance, marginal wells and newly-drilled wells in effect are able to produce only because the share of the market assigned to all other wells, including those of the most efficient and low-cost producers, is simultaneously reduced.



Under these arrangements even those producers who own a great deal of "shut-in" production, if they are to maintain their share of the market, must also drill and develop new wells on all lands under lease. This inevitably leads to excess producing capacity.

Since the discovery of the Leduc oil field in 1947, Canada's dependence on outside sources for petroleum has declined from some 90 per cent to approximately 40 per cent at the present time. The Canadian economy is sounder because of this development. The climatic conditions of large parts of the country are such as to demand an assured source of fuel for space heating purposes. Canada also shares in the high per capita consumption of energy which is characteristic of the North American continent and petroleum products, particularly in transportation, form a vital element in this use of energy. Petroleum products constitute approximately 54 per cent of all energy supply in Canada.

In the United States the requirements of national security have been used to justify the imposition of import quotas on crude oil and products in order to maintain the domestic industry at its optimum level of production. Canada depends on imported crudes and products to a much greater degree than the United States, with such dependence being almost complete in the case of the Province of Quebec and the Atlantic Provinces. It is self-evident that access of Canadian crude to the Montreal market would diminish the economic risks to which this part of Canada would be exposed in the case of any interruption of international supplies. The Commission has not attempted to appraise the probability or otherwise of any such dislocations to supplies in time of peace. In terms of national defence in time of emergency the importance of self-sufficiency in petroleum would depend upon the character of the emergency. The Commission has made no attempt to obtain

information or views on these questions and offers no comments beyond saying that, while the problem of ensuring the continuity of supplies in time of emergency would exist in respect of many supplies, petroleum would undoubtedly be one of the most important.

One benefit of the increased production resulting from the supply of the Montreal market by Canadian crude would be that of added revenue to industry and to provincial governments. An increase in production of 200,000 barrels per day would raise the value of the year's output by some \$160 million. Of this, approximately \$20 million would accrue to provincial governments in the form of royalties. This does not include benefits which would accrue to provincial governments through added revenues from land sales and rentals.

The impact on investment resulting from an increased production equivalent to that required to supply the Montreal market would be of great significance to the Canadian economy. Based on discovery and cost experience of the period 1952-58, it is estimated that the addition of a market equivalent in size to the Montreal market would involve expenditures of \$75 to \$100 million per year, of a capital nature, in the producing sector of the industry. This direct capital investment could bring about substantial secondary investment and although the oil producing industry is not a large direct employer of labour, it might be expected that increased activity resulting from the higher rate of production would increase employment in that industry by 15 to 25 per cent, or by 3,000 to 5,000 workers.



## CHAPTER 6

### CONCLUSIONS AND RECOMMENDATIONS

In our first report dated October 22, 1958, we did not deal in detail with the question of the reserves in Canada of crude oil or the problems relating to Canadian and export markets for such oil. We indicated in that report only that Canada clearly had sufficient proven and probable reserves of crude oil to enable it to continue to export crude oil to available markets. As a consequence we recommended that its export be permitted under annual licence. We were addressing ourselves, of course, to the export of crude oil by pipe line and the continuance in existence of the same procedures with respect to such annual licences as had been in effect in Canada for many years pursuant to the Exportation of Power and Fluids and Importation of Gas Act and regulations made thereunder. Under this system of licensing data have been obtained by the Government of Canada and a form of control maintained over the export of a vital source of energy in the early stages of development of the industry. Such licensing would not seem to have had any restrictive effect on the development of the industry, as pipe lines have been built in Canada connecting with pipe lines in the United States and with refineries in both countries.

Our further study of the situation has established beyond doubt, in our opinion, that Canada has ample proven reserves of crude oil to meet domestic requirements and to permit a substantial increase in the volume of exports. Proven reserves of crude oil at the end of



1958 were in excess of 3 billion barrels. With the addition of natural gas liquids, the total liquid hydrocarbon reserves at the end of 1958 were at least 3.6 billion barrels. If Canadian oil were to supply the whole of the petroleum product demand throughout Canada, the proven reserves would suffice for 13 years at the 1958 rate of consumption. However, there is general agreement that Canada's ultimate reserves will prove to be much more substantial.

In the case of natural gas, the need to ensure that domestic requirements for the foreseeable future could be met requires the maintenance of a system of export licences and in our first report we made certain recommendations in this regard. The marketing of crude oil does not give rise to the risk of a future shortage of supplies such as is inherent in the methods used to market natural gas. Commitments for the export of natural gas are made for periods as long as 20 years. It is not the practice in the oil industry for commitments involving the purchase of crude oil to be made for any great length of time. Such commitments are usually of a short-term nature.

Having regard to the trends in the discovery and growth of reserves in Canada, future Canadian requirements will not be jeopardized, in our opinion, if exports of crude oil are permitted and encouraged. Consequently, we do not feel that such licensing of exports by pipe line as has heretofore prevailed need now be continued. In an emergency, Canada could take prompt action. At the present time the limitations set by the capacity of the existing pipe lines afford a certain measure of control. Furthermore, the information and data with respect to exports of crude oil previously obtained by the Government by means of this licensing system can be made available to the National Energy Board through the Dominion Bureau of Statistics.

However, it should not be overlooked that the terms and conditions under which Canadian crude or products may be imported into the United States will be very important having regard to the exemption accorded such crude and products from United States import restrictions. Canada may find it necessary to reimpose export licences to ensure that Canadian exports of crude or products to the United States will be in accordance with the terms of the exemption given by the United States to Canadian crude and products.

In the foreword to our first report we stated that:

"During the hearings of the Commission, much testimony was given to it with respect to the possibility of Canadian crude oil being used by the Montreal refineries in substitution, in whole or in part, for the foreign crude oil now used by the Montreal refineries. This problem was not a matter specifically included in the terms of reference to the Commission but because of its importance to Canada, to the oil producing provinces and to the oil industry as a whole and because of its close connection with the problem of export markets for Canadian crude oil, the Commission felt that it could not properly decline to have this problem aired before it."

During these hearings and in our subsequent deliberations, it became apparent to us that it was necessary to study and analyse not only the problems involved in the use of Canadian crude oil in the Montreal refinery area, but also the nature and extent of the existing domestic markets now supplied by Canadian crude and the prospects for and nature of possible export markets. This we have endeavoured to do in this report.

As we have previously indicated, Canada has large reserves of crude oil but they are far from tidewater and landlocked in Western Canada. This crude must move long distances overland in order to reach the most important market areas. Costs of exploration, development and production of crude oil in Canada are, in general, higher than in Venezuela and the Middle East and more comparable to those of the United States. The combination of these circumstances puts Canadian crude, in effect, at a disadvantage in world markets and limits possible export markets to the United States.

During the period 1950-57, Canada's crude oil production increased steadily and rapidly from 79,500 to 498,000 barrels per day. In 1958 production declined. In the spring of that year it was at the rate of 400,000 barrels per day and the yearly average was 456,000 barrels per day.

Crude oil exports from Canada remained small until 1954 but during the period 1955-57 they increased from 40,600 to 152,600 barrels per day. Over this period the percentage of exports to total production rose from 11.5 to 30.6 per cent. A significant decline to 86,800 barrels per day, or 19 per cent of production, occurred in 1958.

Oil field activity in Western Canada has involved steadily increasing capital investment. Capital expenditures, which in 1950 were \$54 million, had increased to \$326 million by 1956. This was followed by a decline in 1958 to \$263 million. As a result of the high level of exploration and development activity in recent years, the productive capacity of the industry reached 989,000 barrels per day by 1958. The amount of shut-in capacity has steadily increased to the point where actual production in Western Canada is no more than one-half of productive capacity. Alberta has approximately 90 per cent of the country's shut-in capacity and during early and mid-1958 its industry was operating at little more than one-third of provincial capacity.

All of these factors, namely, the decrease in the rate of production, the loss of exports to the United States and the increase in shut-in capacity, resulted in a desire on the part of certain producers and the Government of the Province of Alberta to secure the only remaining large domestic market not now served by Canadian crude, the Montreal refinery area.

It will be evident from Chapter 5 of this report that there are conflicting views and there is room for considerable difference of opinion on the question of building pipe line facilities to transport western Canadian crude oil to the Montreal refinery area. The Commission realizes that it is natural for the Montreal refiners not to support a project which, in their judgment, is uneconomic at this time. In addition, such a project would result in the loss to their affiliated or parent companies, at least in large measure, of the secure and stable market for their foreign crude represented by that refinery area, with a consequent substantial reduction in sales to them by their parent or affiliated companies. These sales, in the main, are of crude oil produced by these companies under concession in the Middle East or Venezuela. Furthermore, it is "owned" oil as distinct from "prorated" oil and, because of the abundance of reserves and the absence of the same need to replace these reserves compared to the situation in Canada, the proceeds of sales are more readily available, than would be the case in Canada, for purposes other than reinvestment in exploration or development.

The fact is that as long as the Montreal refiners are free to import foreign crude oil into that refinery area the building of pipe line facilities to transport Canadian crude to the area could not be financed and would be useless, unless those refiners entered into appropriate throughput or deficiency agreements obliging them to take Canadian crude transported through the pipe line. Certain of these refiners indicated to the Commission they were not prepared under the circumstances that existed at the time of the Commission's hearings to enter into such throughput agreements. It is obvious that were they to do so they would expose themselves to the possibility that some refiner,



not now in the Montreal area, might in the future construct refinery facilities there and import foreign crude at a laid-down cost below that of the other refiners whose source of supply would be restricted by reason of the throughput agreements.

It was made clear to us that construction of the necessary facilities for delivery of Canadian crude oil to Montreal by pipe line was not likely to be undertaken in the near future by private enterprise without some form of government action. This is the inescapable conclusion to be drawn from the testimony given to us, both by those who favoured and by those who opposed the transportation of Canadian crude oil to Montreal. It follows that if Canadian crude oil is to be transported to Montreal by pipe line, in the near future, the Canadian Government must either be prepared to take action that will result in the construction of the necessary pipe line facilities or build such facilities with public funds.

The choice between a privately built and owned pipe line and a publicly built and owned pipe line is of importance but is secondary, in the Commission's view, to the more fundamental question, namely, whether it is in the public interest for the Government of Canada to intervene in order to assist in making available additional markets for Canadian crude consistent with the maintenance of a low energy cost to the Canadian consumer and a strong and healthy oil industry. In particular, should the Government intervene to alter the economic forces (if, indeed, they are wholly economic in their nature) which now govern the movement of oil within Canada and across its borders and which presumably do not encourage the maximum use of Canadian crude in domestic markets?

As is natural in the circumstances, those who favour the building of facilities to transport Canadian crude oil by pipe line to Montreal tend to draw attention to the resulting advantages to oil producers in Western Canada and to minimize the possibility of increases in prices to consumers and the possible adverse effects of restricted importations of oil upon Canada's foreign trade. Those who are opposed tend to do the reverse.

There is no doubt that, under certain circumstances, there would be great advantages to western Canadian producers if they were to obtain, in the near future, the addition of a secure market for some 200,000 barrels of oil per day with the prospect of expansion through normal growth in demand. This volume, however, would replace imports of a similar quantity and, as the construction of pipe line facilities to Montreal to supply that market area in the near future with Canadian crude would require some form of government action, its effects upon Canada's foreign trade relationships, trade balances and matters of this kind become of direct government concern.

Trade policy considerations are beyond the scope of the Commission's enquiry. How much harm would result to Canadian exporters generally by a deliberate reduction in oil imports or what collateral effects there might be on wider issues of international relations and on trade balances, we do not feel called upon to determine. We do, however, recognize that trade policies and other international considerations are involved and must be taken into account if and when imports of foreign crude into domestic markets are restricted by government action in order to enable the construction of pipe line facilities to any such market for the transportation of Canadian crude oil to refiners located therein. In addition, of course, the price structure of petroleum products, the overall advantages or disadvantages to the

oil industry of possible further reductions in well-head prices and other considerations of a domestic nature would have to be taken into account.

The proposal to transport crude oil to Montreal raises many of the traditional arguments respecting national policy. What price should Canada be prepared to pay to strengthen the East-West lines of trade and communication? To what extent is it possible for Canada to shape her economic policies, without giving careful consideration to those followed by the United States, having regard to Canada's population, resources and geographical location on the North American continent? Canada is not a natural economic unit. There have always been powerful centrifugal forces of an economic nature tending to separate the nation into regions and it has been necessary that these forces be resisted to some degree in order to build a nation from a group of widely separated regions. Confederation itself involved the construction of a trans-continental railway to link the outlying provinces with the central ones, even though cheaper transportation might have been obtained through the United States. The national policy with respect to natural gas exports, which we affirmed in our first report, recognizes this same underlying principle and there are many other illustrations of it.

The building of the Interprovincial and Trans Mountain pipe line systems for the transportation of crude oil, immense steps forward in the evolution of the Canadian economy, involved certain risks but were the result of private enterprise without government intervention. The Commission is impressed by the fact that many of the arguments submitted in opposition to the construction of pipe line facilities to Montreal could be applied to the Interprovincial pipe line system were it now in contemplation rather than in existence. Indeed, such arguments could also be applied, with perhaps even greater force,

to the Trans Mountain pipe line system were it not in existence. It may be doubted whether these pipe line facilities would have been built or extended, as they have been, without some kind of government action if the uncertainties which now exist in the world oil industry and the conditions which now govern and may continue, for some time, to govern production, marketing, pricing and international movement of oil, had been present when the various decisions were made to build and to extend these two systems.

Until the discovery of the Leduc field in 1947 Canada was almost wholly dependent upon imported oil. This dependence was recognized as a serious weakness in our economic fabric. Indeed, the Leduc and subsequent discoveries of crude oil contributed greatly to the reduction of expenditures on oil imports and stimulated the investment of large sums of foreign capital. Oil and natural gas are now available in Canada in abundance. Because gas can at present be transmitted in quantity only through pipe lines, is not an internationally traded commodity in the same sense as crude oil and because large supplies were required to meet the Canadian demand, it became necessary at an early period to reach a decision on national policy, i.e., to limit exports of gas to the surplus available after providing for all Canadian requirements in the foreseeable future. In our view, the time has come when it is highly desirable for Canada to reconsider and restate its national policy with respect to oil.

It seems clear that if a decision were made to permit the construction of pipe line facilities to transport Canadian crude to Montreal they could be built by private enterprise, under existing conditions, only with the approval and co-operation of the Montreal refiners. A similar situation existed in Vancouver when the Trans Mountain pipe line system was constructed. The financing of its construction was



made possible by deficiency agreements. This procedure presumably could be followed with respect to the Montreal refinery area. However, this would place a heavy financial burden on the Montreal refiners and would expose them to the risk of new refineries at Montreal being established in the future by companies with no financial interest in the pipe line facilities and with an incentive to use foreign water-borne crude rather than Canadian crude.

The need for government action to facilitate the construction of pipe line facilities to Montreal led to a discussion before us of possible types of action, including the imposition of customs duties. In our opinion, a customs duty, the traditional form of protection against imports, would, in itself, be of doubtful value in securing the construction of the pipe line facilities. The vendors of the foreign crude oil to the Montreal refiners might well be prepared to make, either directly or indirectly, substantial reductions in posted prices in order to preserve the Montreal refinery area as a market for their crude oil. It is impossible to estimate how high a duty would be required in order that it might be prohibitive. Furthermore, the imposition of a nation-wide customs duty might have the effect of raising, unnecessarily in our view, the internal cost of a vital source of energy to Canadian consumers. For these and other reasons we do not believe that a customs duty should be applied for the purpose of encouraging the construction of pipe line facilities to transport Canadian crude to Montreal.

There was agreement in general by those who gave testimony to us on the subject that some form of quantitative restrictions on imports would be required for the financing of the construction of such facilities. The implications of any such government action, the lack of

export markets in the face of large imports of foreign crude to the eastern seaboard of Canada and the low level of production of the industry have necessitated, in our view, a consideration of what might be Canada's national policy with respect to its oil industry.

Oil is a vital requirement of modern industry and is the most important source of energy in Canada. It accounts for approximately 54 per cent of Canada's present energy supply. Canada must have oil at all times and it is undoubtedly in the national interest that it should at least be in a position rapidly to make itself as independent as possible of imports, which may be subject to interruption. That is one of the reasons why the Leduc and subsequent discoveries of crude oil in Canada have been of such national significance.

It has at times been suggested that a country conserves its resources of crude oil by importing foreign crude and utilizing it instead of domestic production. However, the effect of such imports of foreign crude on exploration for and development of Canada's resources must be considered. The primary ability to make expenditures for exploration and development comes from the actual and anticipated revenues from production. If expenditures on exploration and development are not incurred, the oil reserves may neither be discovered nor developed and therefore would not be readily available for future use. Finding and developing oil fields is a process which commonly extends over many years and, while oil may exist in the ground, it is not available to a country until discovered and developed. If imports of foreign crude displace domestic production so that such production suffers from lack of adequate markets, there is bound to be a decrease in the revenues of the industry and a consequent slackening of the incentive and initiative needed for exploration and development.

A healthy, strong and vigorous Canadian oil industry is clearly essential not only from the point of view of its importance to the Canadian economy but because this country should have ample supplies available to enable it if necessary to meet its own requirements as well as to supplement those of other countries which, during an emergency, might be dependent upon North American sources of supply. The present level of production in Canada is low relative to capacity and it is highly desirable that it should be substantially increased. In Chapter 4 we have already referred to the concern of the Canadian Petroleum Association with the situation faced by the industry as expressed in its policy statement issued in April, 1959.

In 1958 Canada imported approximately 45 per cent of its domestic requirements of crude oil and yet had a production potential sufficient to supply more than the whole of its requirements. As a result of this and of the lack of exports the level of production of the industry in Canada was only 47 per cent of its potential production. We are not aware of any other country which could produce all that it needs, has reserves to sustain such a production and which maintained its production at only 47 per cent of its potential, as did Canada in 1958.

The following tabulation illustrates the production, demand and reserve ratios for oil for the United States and Canada for the years 1956-58.

PRODUCTION, DEMAND AND RESERVE RATIOS IN THE PETROLEUM INDUSTRY

UNITED STATES AND CANADA

	United States		1956	1957	1958	1959	Canada	1957	1958
Potential Production ('000 bbl./day)	9,500	9,700	10,373(1)	772	905	989			
Annual Production ('000 bbl./day)	7,951	7,973	7,506	478	507	463			
Actual Domestic Demand ('000 bbl./day)	8,777	8,818	9,065	718	742	765			
Industry Status									
Production/Productive Capacity	84%	82%	72%	62%	56%	47%			
Demand/Productive Capacity	92%	91%	87%	93%	82%	77%			
Production/Actual Domestic Demand	91%	90%	83%	67%	68%	61%			
Remaining Reserves ('000,000 bbl.)	36,300	36,000	36,700	3,129	3,269	3,650			
Life Index (Years Supply)									
Based on Production	12.5	12.4	13.4	17.9	17.7	21.6			
Based on Demand	11.3	11.2	11.1	11.9	12.1	13.1			

(1) World Petroleum, February 15, 1959

Source: U.S. Bureau of Mines, Dominion Bureau of Statistics,  
Canadian Petroleum Association.



While we realize that comparisons with respect to levels of production between the United States and Canada involve certain reservations, nevertheless we feel that the foregoing tabulation does give an indication of the relative position of the two countries in certain respects. The tabulation indicates that in 1958 the ratio of actual production to potential production in the United States was 72 per cent and in Canada 47 per cent, whereas in the United States the demand for crude was 87 per cent of potential production and in Canada 77 per cent. If one considers the percentage of production to demand, the figures for 1958 are even more significant as between the United States and Canada. In the United States the industry produced 83 per cent of the domestic demand, while in Canada it produced only 61 per cent.

Although we have not included in the tabulation statistics and percentages applicable to the provinces of Alberta and Saskatchewan, it is of significance that in 1958 the level of actual production to potential production in Alberta was 39 per cent and in Saskatchewan 79 per cent.

Crude oil has been found in quantity in Canada only during the past 10 to 12 years. Exploration and development have been relatively intense and, in the result, highly successful. A large potential production has been developed but the demand for such production has not increased at the same rate. It is to be expected, however, that the ratio of production to producibility should be less and the life index of the reserves should be greater than in the United States, where the industry has a record of growth and development over many decades.

The United States has announced a policy designed to maintain a strong and healthy domestic oil industry with a continuing incentive

for further exploration and development of reserves in order to achieve as large a measure of national self-sufficiency as possible in the interests of national security.

Canada's need to maintain a healthy oil industry is just as important as is that of the United States and because the producing sector of the Canadian oil industry is still in the early years of development and at a stage where adequate market outlets are necessary perhaps Canada's need to take action is as urgent as was that of the United States, although any such action by Canada does not necessarily need to be the same as that taken by the United States.

There is no doubt that in Canada there is oil in large quantities, but its production is economic only when related to North American markets. Canada has an industry with the skill and access to capital, together with the will and drive to find, develop and produce additional crude oil. If sufficient incentives to do so do not exist, the industry will be faced with a relatively low production and a low cash flow, with all that this means to the industry itself, to related industries and to the Canadian economy as a whole, despite the great potential of the industry in terms of undiscovered or shut-in capacity. On the other hand, an expanding oil industry, having strong reserves, able to continue to attract capital and assured of expanding markets, promoting as it will the further economic development of the country, as well as providing a secure supply of such an important source of energy as crude oil, will help to achieve a better balance between the various regions of Canada, will make an important contribution to Canada's trade and will continue to bring large benefits to the Canadian economy.

The problem is how best to increase the level of production of the oil industry in Canada to the point where such production will sustain a strong

and healthy industry without adversely affecting the cost of energy to the Canadian consumer. In dealing with this problem, it is desirable to consider what might be done to increase the use of Canadian crude in refinery areas in Canada where it is now used, in whole or in part, and also to consider what prospects now exist for the export of Canadian crude.

The Vancouver refineries are now supplied wholly by Canadian crude oil through the Trans Mountain pipe line system. Nevertheless there is the danger that foreign waterborne crude could move into the Vancouver area or, indeed, that additional amounts of products refined from foreign crude could be imported by consumers or dealers in that refinery area, thereby lowering refinery runs of Canadian crude. While the investment of the Vancouver refiners in the Trans Mountain pipe line system, as well as their ownership of resources of Canadian crude, give an incentive to them to use Canadian crude, nevertheless it would be possible for new refineries lacking such incentive to be established in the area with the intention of importing foreign crude.

The refineries in Ontario are, in large measure, supplied by Canadian crude oil but products refined in Montreal from foreign crude moved into Ontario at the rate of approximately 59,000 barrels per day in 1958. Certain refiners, who control the Trans Northern products pipe line, through which these Montreal refined products are shipped, have indicated that they intend by 1962 substantially to replace these products with the products of Ontario refineries. Canadian crudes are now fully competitive at the Ontario refineries and this programme could undoubtedly be accelerated, resulting in the use of approximately an additional 50,000 barrels daily of Canadian crude in the Ontario refineries in the near future. It is our understanding that sufficient capacity is available through the Interprovincial pipe line system for

the transportation of this additional Canadian crude to the Ontario refineries and that spare refinery capacity exists in Ontario to take such crude, although this would involve inter-company exchanges and commercial arrangements of that nature..

However, this programme could be adversely affected by further declines in the price of overseas crudes. Moreover it must not be overlooked that tanker shipments of foreign crude or of petroleum products refined from foreign crude may, as the result of the opening of the St. Lawrence Seaway, move into Ontario thus reducing the runs of Canadian crude in the Ontario refineries.

In the Maritime Provinces the only existing refinery is in the Halifax area but another is in course of construction at Saint John, New Brunswick. We do not suggest that these refineries could operate on Canadian crude oil transported by pipe line and we do not consider that, under existing conditions, steps should be taken to substitute the running of Canadian crude oil for foreign crude in the refineries in the Maritime Provinces.

It was estimated by the Alberta Oil and Gas Conservation Board (Table XXVI) that Canada's productive capacity in 1959 will be 1,072,000 barrels of crude oil per day. Imperial Oil Limited estimated to the Commission in early July, 1959, that 422,000 barrels per day of crude oil and condensate will be required in 1959 for domestic markets now served by Canadian crude. The Alberta Board estimated that productive capacity in 1960 will reach 1,157,000 and, in 1961, 1,250,000 barrels per day. Imperial Oil Limited estimates that, in 1960, 440,000 barrels per day of Canadian crude and condensate will be required for the domestic markets now served by Canadian crude. If the products produced from 50,000 barrels per day of foreign crude at Montreal were



displaced in the Ontario market by an equivalent amount of products refined in the Ontario refineries from Canadian crude, the demand for Canadian oil in the refining centres of Canada, other than in the Montreal area and in the Maritime Provinces, would be of the order of 490,000 barrels per day in 1960. If pipe line facilities existed and Canadian crudes were also used in the Montreal refinery area, production of Canadian crude oil could be close to 700,000 barrels per day in that year, even without exports.

As we have already indicated, the United States is the only presently attainable export market for Canadian crude. The exemption from the United States mandatory import restrictions of crude oil, unfinished oil and finished products entering that country by pipe line, motor carrier or rail from the country of production represents an important change in the attitude of the United States towards Canadian oil and products. While we realize that the many possibilities, problems and implications may not have been fully reviewed as yet, this exemption could be the first step leading towards the development of a continental policy with respect to crude oil, under which Canadian and United States crudes would be freely used in refinery areas on the North American continent, supplemented by such imports of foreign crude as might be necessary to augment any shortage of supply from North American sources.

We mention the possibility of a continental policy not because we believe that it can necessarily be developed in the immediate future but because we feel that care should be taken to ensure that Canada, by its actions and commitments now, does not jeopardize the subsequent

possible development of such a policy. This presupposes, of course, that the maintenance of a strong oil industry in Canada will not be jeopardized by undue delays in the determination of any such continental policy and that the immediate problems of the industry can be satisfactorily resolved.

The exemption of Canadian crude from United States import restrictions was made effective on June 1, 1959, and we feel that sufficient time has not elapsed to enable any definite opinion to be formed with respect to the effect which the importation of Canadian crude may have on the individual quotas of United States refiners or on the overall quota for imports of other foreign crude in the various administrative districts established in the United States for the purposes of its controls. One interpretation of the regulations leads to the conclusion that such import quotas of United States refiners would be adversely affected, thus reducing their incentive to import Canadian crude.

There is no doubt that exemption from United States import restrictions has improved the prospects for exports of Canadian crude oil to the United States. However, this exemption does not guarantee increasing sales of Canadian crude oil in United States markets. The choice of where it buys is still with the United States refiner. To effect any substantial and stable increase in such Canadian exports, it will be necessary for the Canadian oil industry and for the companies operating refineries in the United States, accessible to Canadian crude, to follow policies which will result in Canadian crude oil being used in these United States refineries, in place of crude oil from other sources, so that Canadian crude will become a continuing source of supply.

As a result of the exemption from import restrictions, Canadian crude is now able, more freely, to compete in United States markets. Nevertheless there are many factors, in addition to price, which affect its market prospects. There would seem to be no question that, on a price basis, Canadian crude is more than competitive with United States domestic crude from California in the Puget Sound area and in California itself even after making allowance for United States customs duty. However, some United States refiners are able to use domestic crude owned by them or their affiliates on which production profits can be realized in addition to refinery profits. Company investment in pipe line and other facilities must also be taken into account. Consequently there are factors other than price with which Canadian crude must contend in order to gain a preference over domestic crude in United States markets.

An import quota or permit is a valuable right under the United States import quota system and it seems highly unlikely that Canadian crude will supplant other foreign crude which can be imported by refineries in the United States under the quotas they may hold from time to time. Refiners in the United States presumably have a strong interest in maintaining outlets in the United States for their owned overseas production and it is hardly to be expected that they would prefer to use Canadian crude in their refineries before exhausting all means, by direct imports and by exchanges (commonly referred to in the industry as "swaps" or "switches"), of utilizing concession crude from foreign countries in which they or their affiliates have heavy capital investments. Consequently we would expect quotas to import overseas oil to be fully utilized in preference to imports from Canada.

As already pointed out, well-head prices of Canadian crude oil are no longer based on the laid-down cost of Illinois crude at Sarnia, Ontario. Simultaneously with a reduction in the transportation charges for crude oil over the Interprovincial pipe line system, well-head prices in Canada were reduced early in 1959 in order to maintain the competitive position in Ontario of products refined from Canadian crude. This has had the effect of reducing the prices of Canadian crude substantially below the prices at which such crude would be competitive with United States domestic crudes in certain United States refining areas. The change in the method of determining well-head prices in Canada illustrates the fact that the Canadian oil industry is exposed to the world price of crude oil at a time when there is a world surplus of crude.

Conditions of uncertainty and over-production in the world oil industry are likely to continue for some years and world oil prices may decline further. If they do and the reduction is substantial and is reflected in lower well-head prices for Canadian crude oil, the results could be very serious for the Canadian industry. In view of the difference between exploration, development and other industry costs in Canada and those in Venezuela and the Middle East, a well-head price that would still be satisfactory in Venezuela or in the Middle East could, if reflected in Canadian well-head prices, be highly injurious to the Canadian industry.

A continuously increasing volume of exports to United States markets requires stability and continuity on the part of the policies of the United States and of Canada with respect to oil. Pipe line facilities to serve the West Coast area of the United States with Canadian crude already exist, as do facilities for the present supply of Canadian crude to the Middle West area. The present capacity of the facilities serving the West Coast area are sufficient to support a greatly



increased volume of exports to this area. Additional pipe line facilities and extensions of existing refineries or new refineries would be necessary substantially to increase exports to the Middle West area. This would involve large new investments and time would be required before such facilities would become available. In order to justify the expenditures required to create these facilities, it would in all probability be necessary for the importers of Canadian crude to commit themselves for a relatively long period of time. If United States import policy and Canadian export policy are not stable, the large investments required for facilities to enable export of Canadian crude oil to be increased substantially could not be justified and presumably would not be forthcoming.

The demand for crude oil in the markets of the northern area of the United States from the West Coast to the Great Lakes is of the order of 1,500,000 barrels per day or almost double the total present demand for crude oil for all of Canada. Consequently, even normal growth in demand in this area offers a large potential market for Canadian crude and in our opinion no steps should be taken at this time which might lessen Canada's ability to capture and secure a substantial share of the growth in demand in this large market area.

In our hearings, a majority of the companies which appeared before us emphasized that the most economic markets for Canadian crude oil were the West Coast, Middle West and Great Lakes areas of the United States but they contended that Canadian crude oil was having difficulty entering these markets because of United States import restrictions. These import restrictions have since been removed but, as we have previously mentioned, this, in itself, does not mean that Canadian crude will move in expanding volumes to United States export markets. Energetic steps must be taken by Canadian oil companies, in conjunction with their inter-

national affiliates, to ensure that Canada will be able fully to enjoy the benefit of the exemption accorded to it by the United States.

The Canadian oil industry should now be expected to pursue, in the national interest, a vigorous policy of promoting the export of Canadian crude oil into these and other areas, so that Canadian crude can establish itself as a continuing source of supply in United States markets in sufficient volume to enable the industry in Canada to expand and maintain a high level of production. This, in effect, implies that the initiative substantially to increase the level of production of Canadian crude oil through exports will be left to the oil industry itself and that the oil companies will, in the national interest of Canada, have an opportunity to take full advantage of the recent action of the United States in exempting Canadian crude oil and products from its import restrictions.

Our review of domestic and export markets, present and potential, for Canadian crude oil has led us to the conclusion that if there were an effective national policy ensuring the use of Canadian crude in domestic markets, now accessible by pipe line, and encouraging the use in those markets of products refined from Canadian crude, and if Canada were successful in the immediate future in substantially increasing its exports of crude oil to the United States, the production of Canadian crude could be maintained at a level adequate to sustain a strong industry and to provide the incentive for further exploration and development.

We have in mind a target level of production by the end of 1960 approximating 700,000 barrels per day. Thereafter, the normal growth in demand in domestic markets now served by Canadian crude,

together with expanding exports which the industry with intensive efforts should be able to secure, would increase this level of production. If the exploration for further reserves should prove to be highly successful the industry should expect the ratio of production to producibility to decline. The essential point, in our judgment, is that the level of production should be such as will sustain the industry as a healthy and vigorous one and that the industry itself should seek and capture export markets which, with the normal growth in domestic markets accessible by pipe line, will be sufficient for this purpose.

It should be possible to achieve this level of production of approximately 700,000 barrels per day by the end of 1960 and to increase it thereafter by ensuring the utilization of Canadian crude in the Canadian refinery areas accessible by pipe line and by vigorous and imaginative steps by the oil industry to secure a larger share of present and future United States markets. In our opinion the industry should be given an opportunity to develop those markets and make them secure for Canadian crude.

We believe that if and so long as it is demonstrated by the efforts of the industry that these basic assumptions as to domestic and foreign demand are justified, it is neither necessary nor desirable to take action to secure the Montreal refining area as an outlet for Canadian crude. Moreover, we believe that a decision to impose restrictions in order to secure the Montreal market, if made before the potentialities of United States markets were fully exploited, would, among other things, seriously impair Canada's ability to secure those markets, might prejudice Canada's position vis-a-vis existing United States import restrictions and might jeopardize the development of a continental oil policy.

Having regard to the international associations of the refiners in Montreal and in the Maritime Provinces and to the large shut-in capacity of crude oil in Western Canada, in which most of these refiners have substantial ownership, it is our view that these refiners should be prepared to strive assiduously to offset their imports of foreign crude by exports to United States markets. These refiners should be prepared to work out private commercial arrangements with their suppliers or affiliated companies or with other companies which have a large stake in Canadian oil production and could utilize Canadian crude in United States refineries. Some Montreal refiners have already made such arrangements but the level of exports which they and other refiners could achieve by intensive efforts of the industry in our opinion has not yet been attained. Those Montreal refiners which have already made arrangements of this nature with respect to certain volumes of Canadian crude and which own crude oil resources in Canada should be able to increase these volumes. Those Montreal refiners, which have not already done so, should be expected to effect arrangements of this nature, the quantities involved depending upon the volume of their imports, the extent of their crude oil resources in Canada and their affiliations and connections with United States oil and refining companies.

The prices of Canadian oil would not be an impediment to such arrangements and they should be attractive, particularly if the United States importer, through an affiliated or associated company, gets a corresponding outlet for foreign crude in Canada. We believe there is no real reason, therefore, for either the Canadian importer, the foreign supplier of the Canadian importer or the United States refiner who could use Canadian crude not to enter into such commercial transactions.



We are conscious of the fact that in order to ensure the maximum possible utilization of Canadian crude in the refinery areas in Canada now served by such crude that a system of licensing of imports of crude oil may have to be put into effect. So far as we are aware at the present time foreign crude is not interfering with the use of Canadian crude in the refinery areas in Canada to which such crude can be transported in adequate volumes by existing pipe line facilities. We have pointed out, however, that this might occur. If it does, then, in order to ensure the maximum utilization of Canadian crude in those refinery areas, it may be necessary to license imports of crude oil and to deny such licences (except for some good and sufficient reason) to any refiners in a refinery area where adequate pipe line facilities, now or hereafter, exist for the transportation of Canadian crude oil to meet the demands of that refinery area. This licensing system could be imposed on a nation-wide basis or made applicable only to one or more refinery areas as the circumstances might require.

This system of licensing, if imposed on a nation-wide basis, would apply to imports of crude oil into all refining areas of Canada but would only involve restrictions on imports where pipe line facilities are in existence for the transportation of Canadian crude to any such area. It would, for example, restrict imports of crude oil into the Toronto and Vancouver refining areas where such pipe line facilities now exist. It would restrict imports of crude oil into the Montreal refining area only if and when pipe line facilities have been constructed to transport Canadian crude to that refinery area. There is no present prospect that it would ever restrict imports into the Maritime Provinces.

Canada's imports of crude oil come from the Caribbean area and from the Middle East. Practically no United States domestic crude is imported. In fact, in 1958 United States crude oil was imported at

the rate of only 3,800 barrels per day, and this represented 1.3 per cent of total imports, as 98.7 per cent came from other producing areas. We see no necessity, under existing conditions, to contemplate licensing the importation of crude oil produced in the United States and if a licensing system is brought into effect we would recommend that such imports be exempted if that is possible, having regard to Canada's international commitments. We assume that the present import restrictions in the United States would not permit exchanges to be made within the industry which would allow overseas oil to be imported into that country in substitution for United States domestic crude exported to Canada. Furthermore, Canada would have a measure of control through its jurisdiction over the construction of any pipe line facilities in Canada designed to transport such crude from a border point.

As we have already stated, the United States imposes a customs duty of 10.5 cents per barrel on imported crude oil. Whether in the interests of a continental oil policy this duty could be eliminated, with respect to Canadian crude, whether the exemption from United States import restrictions could be extended to coastal tanker shipments of Canadian crude and products or whether Canada should impose a like customs duty on imports of foreign crude we express no opinion. These are some of the matters, however, which should be considered in the development of any continental oil policy.

We have not attempted to set out the details with respect to a licensing system because we realize that exceptions might be required for certain types of crudes and that problems of a technical nature may be involved. At the present time, for example, and presumably for some years to come, certain types of petroleum products will have to be imported into Canada to balance refinery runs and to meet seasonal variations in demand. We are of the view that the oil industry itself

is able to supply any necessary information and to assist in the resolution of whatever administrative difficulties may arise in putting into effect such licensing procedure. The National Energy Board, as a permanent body of the Government of Canada, provides a forum where the industry can discuss its problems at the Canadian government level. What is perhaps of more importance, this Board as an agent of the Government can and should keep in close touch at all times with the industry, in all its phases, and with its problems, as these have a bearing upon the prosperity of the Canadian economy and of the industry itself. Consequently, we believe that the problems involved in such licensing procedure can and should be resolved through discussions between that Board and the industry itself.

This system of licensing would lay the foundation for the building of pipe line facilities to transport Canadian crude to Montreal, if and when it becomes necessary and desirable that they should be built. Once it has been declared to be national policy that Canadian crude should supply the Montreal refinery area, any group interested in constructing the pipe line facilities would be in a position to organize a company and apply to the National Energy Board for a permit to proceed because the group would know that, when such facilities existed, refiners in the Montreal area would be denied an import licence for foreign crude, to the extent that their proportion of Canadian crude can be transported through such pipe line facilities. It would then be the responsibility of that Board to deal with any such application in the light of all the relevant circumstances.

We wish to point out that in the absence of a licensing system such as we have indicated, the Montreal refiners or any one of them are in a position to block any plans for the use of Canadian crude in the Montreal refining area and no pipe line facilities for such purpose could

in fact be built without their approval and co-operation. In other words, in our opinion, if it should become advisable to move Canadian crude to Montreal in order to maintain a healthy oil industry in Canada, then a licensing system involving restrictions on the importation of overseas oil would be necessary.

A system of throughput agreements, supported by licensing of imports and assurance of supply, should be sufficient to attract the necessary capital. One theoretical risk would be that a future government or Parliament could decide to change the licensing system and permit the establishment of refineries which would have no obligation to take a share of Canadian crude through the pipe line, although this would be so manifestly discriminatory as to be most unlikely. We have mentioned assurance of supply because we believe that this would enable the facilities to be financed in the most economical manner. This would involve appropriate arrangements with or declarations of policy by provincial government authorities in the producing provinces of Western Canada to ensure that the Canadian crude to be used in Montreal would be made available to the refiners in sufficient volume and at fair and equitable prices.

The Commission has not considered it necessary to reach any definite conclusion as to the route which a pipe line to Montreal should follow, if one is to be built. The choice of the route would depend upon many factors. If the economic factors involved, such as the throughput of the line and the demand for Canadian oil transported through its facilities should justify the building of a new pipe line from Western Canada, an all-Canadian route would have certain advantages. Such a route would ensure that the pipe line would always remain under Canadian jurisdiction, including rate or tariff regulation. It would mean also that no part of it or of the oil which moved through it would be subject



to the jurisdiction of any taxing authority, other than in Canada. Furthermore, looking to the future, the selection of an all-Canadian route could mean the construction of refinery and other facilities in areas where they do not now exist and thereby contribute to the development of the regions of Canada through which it would pass. On the other hand, to insist upon an all-Canadian route as a matter of policy, if the financing of the line were left to private enterprise, might involve the Government of Canada in a situation similar to that which, in the case of the West-East movement of natural gas, was encountered by reason of the decision that the route of the natural gas pipe line should be an all-Canadian one. Similarly, the choice of route would be affected by the prospect or otherwise of its supplying, in whole or in part, export market areas in the United States. If an oil pipe line were built by government, it would presumably be imperative that it should follow an all-Canadian route.

If it were determined that the demand, in whole or in part, for crude oil in the Montreal refinery area should be met by Canadian crude, the economy in unit transportation costs of a modern large-diameter pipe line should be carefully considered. In reaching any decision account should be taken of the anticipated reduction in the demand of the Montreal refiners for crude oil over the next few years, after giving effect to the maximum possible utilization in the Ontario market of products refined in that province from Canadian crude, as presently proposed by certain Ontario refiners. In any case the Montreal refiners would be obliged to continue to import certain crudes or additional petroleum products. Consequently, careful consideration should be given not only to the route to be followed by any such pipe line facilities but also to the possibility of any markets which these facilities might serve in addition to the Montreal refinery area. Furthermore, the effects of any action taken to ensure the building of such pipe

line facilities on the substantial investment in the existing Inter-provincial pipe line system should not be overlooked. Care should be taken that this investment is not put in jeopardy.

We do not consider that the same need may arise in the near future to license the importation into Canada of products refined from foreign crude oil as we have indicated may arise with respect to overseas crude oil. Importation of petroleum products has an effect on the determination of the price to the Canadian consumer of products refined from Canadian crude and any restriction on such imports, other than the existing restriction by way of customs duty, could disturb the pricing structure of petroleum products in Canada. However, it is quite possible that as time goes on licensing of petroleum products may be required to ensure the full implementation of any policy along the lines which we have stated we believe to be in the national interest.

We believe that, if the national policy which we recommend is adopted, the Canadian oil industry should enjoy immediately and in subsequent years a higher rate of production than would be possible by a decision at the present time to supply the Montreal refinery area with Canadian crude, a decision which, in any event, could not be implemented before 1962. We are assuming and, of course, would expect that the industry, after its initial efforts in bringing up the level of production by capturing sufficient domestic and export markets, would continue to expand the production of Canadian crude in line with the growth of sales outlet possibilities in both the domestic and export markets.

Our proposals are designed primarily to afford to the industry an opportunity to increase the level of production of Canadian crude and thereby to sustain a healthy and vigorous Canadian industry. They leave open the question of supplying the Montreal market with Canadian crude in the event of failure of efforts to assure a continuing adequate level of

production. The Montreal question can still be considered and a decision made in the light of the later circumstances. In the meantime, the industry will have enjoyed, with a minimum of interference or action by the government, a level of production which it would otherwise not have been able to attain.

To summarize, the Commission recommends:

- (1) That it be national policy
  - (a) to encourage and permit the export of Canadian crude oil without licence, and
  - (b) to ensure the continued use, consistent with the interests of the Canadian consumer of petroleum products, of Canadian crude in refinery areas of Canada accessible to it by existing pipe line facilities, thereby increasing the market outlets for such crude oil.
- (2) That to implement such national policy the oil companies concerned take steps as soon as possible to displace, with products refined from Canadian crude, a volume of petroleum products now moving into the Ontario market from the Montreal refinery area equivalent to approximately 50,000 barrels daily of crude oil.
- (3) That to implement further such national policy the Canadian oil industry take vigorous and imaginative action very substantially to enlarge its markets in the United States on a basis that will ensure the continuing participation of Canadian crude in these markets and in their expansion.
- (4) That no Government action should at this time be taken to ensure the construction of pipe line facilities to transport Canadian crude oil to the Montreal refinery area and that before any such action is taken an opportunity be given to the oil industry to demonstrate that it can find markets elsewhere in Canada and the United States sufficient to sustain a healthy and vigorous Canadian oil industry with the incentive for further exploration and development.

- (5) That, if Government action should become necessary to implement the national policy we have recommended above, imports of crude oil be made subject to licence and that such licences be denied (except for some good and sufficient reason) to refiners in a refinery area in Canada where adequate pipe line facilities exist for the transportation of Canadian crude oil to meet the demands of such refinery area, but that crude oil imported through a pipe line or by motor carrier or rail and produced in the country from which such crude oil is imported be exempted from such licensing.

In making these recommendations, we do not wish to imply that if they were accepted and implemented the problems of the producers of crude oil in Western Canada will be at an end. On the other hand, we believe that the interests of Canada and of such producers, if the industry accomplishes what we believe it can and should accomplish, particularly with respect to increasing the level of demand for exports to United States markets, will be better served both immediately and in the future than if a decision were now made to facilitate by Government action the construction of pipe line facilities for the transportation of Canadian crude to the Montreal refinery area. If the industry takes the necessary and imaginative steps, the next 12 to 18 months should suffice to make it apparent whether or not the production of Canadian crude can be raised to the desired level. We suggest that the National Energy Board should be requested to keep this situation under review as well as the question of supplying Canadian crude oil to the Montreal refinery area in the light of the circumstances as they may from time to time develop.

The history of the industry in Canada since the discovery of the Leduc field in Alberta in 1947 shows that some sections of the industry have directed greater efforts towards the finding and production of oil than to considerations of markets. It is only within recent months that



world conditions in the industry have emphasized the importance of expanding markets simultaneously with the proving and development of reserves. It is highly desirable that the full extent of Canada's reserves of crude oil be established as soon as possible. We suggest, however, that the appropriate authorities in each producing province should be urged to keep their policies and regulations concerning exploration and development under constant review, in order that development may proceed in as orderly a manner as possible in relation to available markets for Canadian crude.

Low cost energy has been and will remain a vital factor in the Canadian economy. Policies designed to encourage the development of the Canadian oil industry should, in our view, always take this factor into consideration having regard particularly to Canada's growing industrial development and its dependence on foreign markets.

ALL OF WHICH WE RESPECTFULLY SUBMIT FOR YOUR EXCELLENCY'S  
CONSIDERATION

*Henry V. Gordon*

Chairman

*J. Louis Levesque*

*George E. Britnell* \*

*Robert D. Howland*, \*\*

*Henry Lechner*

*R. M. Hardy*, \*\*\*

*J. Parkinson*

Secretary

July 20, 1959

\* Dr. G.E. Britnell has signed the Report subject to the reservations set forth in the Memorandum which follows immediately.

\*\* An addendum by Dr. R.D. Howland appears at page 6-46.

\*\*\* An addendum by Dr. R.M. Hardy appears at page 6-48.



MEMORANDUM OF RESERVATIONS

by G.E. Britnell

I agree with most of the analysis presented in Chapters 1 to 5 of the foregoing Report and, except for one qualification noted below, with the recommendations of the Commission as set out at the end of Chapter 6. My reservations arise from the emphasis given to certain matters of analysis and appraisal in Chapter 6. I think there is a tendency to view the prospects of the oil-producing industry in terms much more gloomy than the circumstances warrant and to assume too quickly that problems of foreign competition should be met by governmental intervention in the form of import restrictions. At the same time, the treatment seems to lack what I conceive to be an adequate appreciation of the serious problems which would result from any governmental action designed to reserve the Montreal market for Canadian crude oil or to protect the Canadian oil industry against the effects of competition from imports in the domestic markets already served by it.

On the first point I feel that Chapter 6 sounds a note of urgency and of warning concerning the present position of the oil-producing industry which is scarcely compatible with the analysis of the industry's quite favourable future prospects presented in earlier chapters. References to the low level of production in the industry seem to me to be somewhat exaggerated, bearing in mind the improvement in production and markets which has already begun to take place and which is forecast to continue for the next decade and to be especially marked during the next three years. The diagnosis of the problems of the industry does not emphasize sufficiently the fact that the reverse which it encountered in 1958 and the early part of 1959 took place at the end of a decade of extremely rapid growth, characterized by a rate of development which could hardly be expected to continue unchecked indefinitely. The special impetus to the expansion of the Canadian oil-producing industry given by the Suez crisis



and the subsequent return to more normal conditions in the world supply and demand situation was bound to be reflected in a sudden rise followed by a temporary reduction in imports into the United States from Canada. In addition, the general economic recession in the United States in 1958 naturally included the oil industry and was accompanied by the application of import restrictions against Canadian and other imported oils, the operation of which also served to reduce the demand for Canadian crude. Some of these adverse factors have, however, already disappeared and in recent months demand, both export and domestic, has improved to the point where Canadian oil production has regained the average annual level achieved during the peak year of the Suez crisis. Furthermore, as an earlier chapter of the Report indicates, there is every prospect that the growth of domestic and export markets will, in the course of the next few years, permit a production of crude oil in Western Canada at least 50 per cent greater than the record level of 1957. Indeed, it seems quite likely that the present rate of production will be at least doubled by 1967. In other words, the short-term production prospects of the industry are probably substantially better than those which most other Canadian resource industries can reasonably anticipate. Just, therefore, as one swallow does not make a summer, the temporary market reverses of Canadian oil producers in 1958 can hardly be taken to indicate a languishing, let alone a declining, industry.

The rather depressing picture of the Canadian oil-producing industry presented in Chapter 6 seems to be very largely the result of preoccupation with recent changes in the ratio of actual to potential production in Western Canada. Such a comparison inevitably tends to magnify the difficulties of the industry. To correct this emphasis it is necessary to point out that it is perfectly natural that a comparatively new and enterprising oil industry - and one which was subjected early in its development to the stimuli arising out of the Suez crisis - should develop excess producing capacity. It should also be emphasized that the methods used by provincial

authorities to foster the development of oil reserves, although justifiable on other grounds, tend to force the pace of drilling without regard to the growth of markets. Yet surely it should not be assumed, as the general tone of Chapter 6 seems to suggest, that it is the responsibility of the Government of Canada continuously and at almost any cost to find new markets to absorb a steadily expanding capacity to produce crude oil. Such a precedent could be expected to encourage claims by many industries for similar treatment. The resulting high-cost economy would be prejudicial to the interests of both the Canadian consumer and Canadian export industries. Nevertheless, having said this, it is relevant to observe that the growth of domestic and export markets for Canadian oil as forecast in the report and as supported by most authorities in the industry can be expected to ensure a substantial improvement in the ratio of production to producibility over the next few years, even if some of the measures recommended by the Commission are not carried out.

For these reasons it seems to me that Chapter 6 also attaches too great a note of urgency to the importance of gaining access for Canadian crude to the Montreal refinery area in the near future and pays insufficient attention to the difficulties that might result from such a course if it were to be attempted in face of the uneconomic features which characterize the project under existing circumstances. The arguments in favour of reserving the Montreal market for Canadian crude are presented extensively and, although the Report recommends against any immediate action to achieve this objective, the general tenor of the concluding chapter leaves the impression that steps should certainly be taken to market Canadian crude in Montreal before very many years have passed.

I do not feel that the problems which this course would give rise to are made sufficiently explicit. I am not referring to the disturbances which government intervention of the kind envisaged would create in terms of Canada's trading policies, although I attach much more significance to this factor than the Report does.

I refer, rather, to the simple, economic disadvantages of the proposal. The plain fact is that, in normal circumstances, the oil-producing industry will obtain a higher price for its output if it concentrates upon the markets already served by it in Canada and in the adjacent regions of the United States than if, with support of government, it directs its efforts toward the more distant market of Montreal. In over-stressing the need for more secure markets and for high-volume markets the Report pays too little attention to the importance of achieving the optimum possible rate of return on every barrel of oil produced so as to ensure the most economical use of the nation's resources. The search for new markets should take account of the need to obtain an adequate price at the well-head so as to provide a continuing incentive to search for the larger reserves that will be needed to provide for expanding markets. Under present economic conditions, as indicated in Chapter 5, Canadian crude oil could not be laid down in Montreal except at a substantial reduction in well-head prices, or at the cost of introducing a full-fledged system of protection. I would therefore regard it as uneconomic and unwise to take the steps necessary to market Canadian crude in Montreal, irrevocable as these would be, until the possibility of finding equally large alternative markets in the United States had been thoroughly tested over a considerable period of time.

In this connection I disagree with the view expressed in the Report that the period of testing such export prospects should be limited to the next year or two and that, failing a very substantial increase in the exports of crude oil to the United States serious consideration should then be given to the steps by which the Government of Canada would ensure the displacement of overseas crude by Canadian crude in Montreal. I agree fully with the view that those responsible for export sales have an obligation to make more strenuous efforts than have so far been made to work out arrangements with United States refineries which will permit



export sales to increase, but I feel that the experience of a year or two would be altogether too short a period on which to base major decisions of policy that would have such momentous significance for the future well-being of this important industry. By the same token, I feel that the overwhelming concern of the Report with the need for a rapid improvement in production by 1960 or 1961, rather than with the long-term prospects of the industry, is quite unwarranted.

It seems to me that the concluding chapter of the Report tends to assume much too readily that, with any increase in the intensity of import competition, the oil industry will have to be protected by government. On this point it should, perhaps, be noted that the Commission was not appointed to investigate the need for protecting existing domestic markets and received no evidence on the subject. It is true, of course, that increases in the world surplus of oil have resulted in lower prices for petroleum in world markets and have brought about a 6 per cent decline in field prices in Western Canada. This may be unfortunate but need not be regarded as a major set-back. Admittedly, any very substantial decline in world prices would create problems for the Canadian oil-producing industry. As the Report suggests, however, the industry has not yet lost any of its domestic markets to imports. Yet the Report tends to assume that the industry is incapable of defending its markets within Canada from any further increase in competition and that any intensification of import competition will have to be met by import restrictions. These assumptions seem to me to be based implicitly on the presupposition that there is little or no scope for any reduction in prices or costs in the various sectors of the oil industry and that this latter method of defending the industry's markets against import competition, which is normal for most other resource industries, is virtually non-existent in the case of the oil industry. The Report gives insufficient attention to the fact that the probable



consequences of any increase in foreign competition would not be a substantial increase in the volume of imports, but rather a downward pressure on petroleum prices, which could affect refinery margins and field prices. There is insufficient evidence to support the inference that no reduction in prices, profit margins or costs can possibly be sustained by the oil industry. Other resource industries have to face foreign competition at home and abroad and to accommodate themselves to changing conditions of competition. It is much too early to conclude that an industry as new and as resourceful as the Canadian oil industry cannot maintain and improve its competitive position without governmental intervention.

It also seems to me that the analysis in Chapter 6 does not emphasize sufficiently that the expansion of the Canadian oil-producing industry must depend, in the long run and for the most part, upon the growth of export markets and that to achieve such markets the cost of producing crude oil and petroleum products must be kept competitive, not only with potential imports, but with the prices at which petroleum from other sources is available to the United States refining industry which provides our only export market. The stress laid on the need to reserve existing domestic markets and, ultimately, the Montreal market for Canadian crude, by means of import restrictions and at the cost of a price structure higher than the world price structure, appears to neglect this all-important consideration. It needs to be emphasized most strongly that reservation of the Montreal market for Canadian crude, if it involves protecting the structure of Canadian prices against the influence of world prices, would be very much a second-best solution to the problems of the industry. If the Canadian oil-producing industry is to grow satisfactorily in future decades it must find continuously expanding markets in the United States. The full potentialities for such expansion can only be realized if the forces making for efficient and low-cost production are permitted to operate freely.

Under a system of import restrictions, however, the incentive to eliminate marginal and inefficient production would steadily disappear, as would appear to have happened in the United States.

Frequent references to the similarity between the economics of oil production in Canada and the United States and to the need for maintaining a level of petroleum prices in Canada more comparable with that of the United States, as well as references to the desirability of a continental oil policy, all seem to me to reflect a lack of awareness of the fact that, because of the Canadian producing industry's need to export, it simply cannot afford to model its policies on those of its United States counterpart. The United States oil-producing industry has virtually lost its ability to compete in outside markets. At the same time the United States has found it difficult to maintain a satisfactory ratio of reserves to production. For this reason it has been thought necessary to keep field prices high in order to increase exploratory drilling even in marginal areas. Policies of protection designed to permit high-cost production to continue in the United States are therefore based upon conditions which find no parallel in Canada. So far as the Canadian oil industry is concerned, there is absolutely no necessity to foster marginal or high-cost production and policies having this result could only serve to reduce the ability of the industry to sell its crude oil in the export market. I conclude, therefore, that what may be good policy for the United States is not necessarily the path of wisdom for Canada.

I must now admit to some possible reservations arising out of that part of the first recommendation of the Commission which suggests that it should be national policy "to ensure the continued use, consistent with the interests of the Canadian consumer of Canadian petroleum products, of Canadian crude in refinery areas of Canada accessible to it by existing pipe line facilities". I take this to mean that it is desirable that the major oil companies

should continue to use only Canadian crude in British Columbia and that the present plan of the industry to fill the Ontario market with products refined only from Canadian crude in Ontario should not be postponed or abandoned. Since the intentions of the industry in this respect are soundly based I see no reason to believe that they will not be carried out. I would not, however, wish it to be inferred that in supporting this recommendation I would favour the use of import quotas or tariffs on imported crudes or products to ensure that no increase in imports was allowed to take place, at least in circumstances comparable to those which exist today. My own feeling is that, assuming no drastic decline in the world price of crude oil, there is little likelihood that overseas crudes will seriously invade the Ontario and British Columbia markets for Canadian crude and that nothing short of a very serious decline in world prices, giving rise to a substantial displacement of Canadian by overseas crudes or products, should be considered sufficient justification for measures to protect these markets. It is quite conceivable that the demand for Canadian crude in these two regions might be temporarily reduced from time to time as a result of seasonal increases in imports of refined products. I would not regard such a situation as abnormal and as requiring the adoption of a complete system of quantitative restrictions on imports - which is a conclusion that might conceivably be drawn from a literal interpretation of the first recommendation - unless the Government of Canada were to find that imports had reached or were likely to reach a very substantial level and unless it were satisfied that the oil industry was quite incapable of meeting this competition by reducing prices. This conclusion goes back to the point made earlier to the effect that proposals for the protection of the domestic market may well involve protection for the existing price and profit structure.

In implying that the Montreal market should, in the relatively near future, be reserved for Canadian crude and that domestic markets



such as Ontario and British Columbia should, by means of government intervention, be maintained solely for Canadian crude or Canadian refined products, the Report tends to obscure the fact that the achievement of either of these objectives would, under present circumstances, probably involve the imposition of a full-fledged system of government controls. Absence from the Report of any extended analysis of the many difficult administrative and economic problems which would arise from government intervention of this nature is, therefore, regrettable. I accordingly propose to mention very briefly some of the problems that would almost certainly emerge. In the first place the government would have to impose an impressive, extensive and detailed array of quantitative controls over the import of petroleum in any form. Import quotas would have to be allocated among the various refining and marketing companies engaged in or likely to become engaged in the business of importing crude oil and petroleum products. Quotas would have to be restricted to amounts which would enable the companies concerned to meet their "normal" market requirements but which would not permit them to extend their markets at the expense of competitors. Thus, for example, refiners and dealers in the Maritime Provinces would be allotted import quotas of crude and of refined products calculated to be sufficient to supply their normal markets. It would be necessary, however, sternly to deny them the right to import additional amounts of crude oil or refined products which might enable them to extend their markets into, say, the Province of Quebec, where they would encounter the competition of products made from Canadian crude. In other words, a system of import quotas would "freeze" the existing marketing position of the various companies and individuals engaged in refining crude oil or in marketing refined products. It would also raise the problem of finding room for new entrants to any branch of the industry. Consequently, such a system would seriously limit the freedom of competition and the flexibility of the oil industry



while its administration would almost inevitably give rise to claims of inequity as between individual companies and as between various regions of Canada.

A system of quantitative import restrictions would further have the effect of completely insulating the price structure of petroleum products in Canada from import competition. This would leave the way clear for the development of a system of "administered" prices, the setting of which would be determined by the few large oil companies which in Canada tend to dominate the business of refining and marketing. But these companies also own and produce the greater part of the petroleum produced in Western Canada. At the present time import competition, or at least the threat of import competition, serves to check any tendency which may exist towards the operation of monopolistic or oligopolistic practices. With the competition of imports removed it is difficult to believe that the establishment of well-head prices by refiners would continue to take place under conditions of "arms-length" negotiations. It is more logical to expect that prices would be maintained at levels much higher than would prevail were imports free to compete. It is not unreasonable to anticipate that, in these circumstances, the Government of Canada might find it necessary ultimately to control and regulate the prices of both crude oil and products. In so doing, the government would become directly or indirectly responsible for the determination of profit margins at the refineries and in the marketing sector of the oil business and, perhaps of even more significance, for the determination of well-head prices. I would suggest that the Canadian Government should not lightly embark upon a course which might easily lead to widespread government regulation of an industry which is quite capable of adjusting itself to the fluctuations of domestic and world markets.

The danger that import restrictions would lead to higher prices

and hence to the possibility of price control was recognized and stated by the Government of the United States at the time of the imposition of mandatory controls. In view of the relatively smaller number of major oil companies in Canada as compared with the United States and the fact that a very small number of major oil companies in Canada are responsible for more than half the total production of crude oil - a situation quite different from that obtaining in the United States - it would seem reasonable to assume that with any significant restriction in imports the need for further government controls would be likely to arise more quickly in Canada than in the United States. Restriction of imports into Canada should, then, be contemplated only as a last resort and only if the Canadian oil-producing industry is faced by an unavoidable and substantial increase in imports and is simultaneously unable, for reasons beyond its control, to develop adequate export markets. But let us not deceive ourselves. Montreal would be a relatively small compensation for the loss of a great export market in oil. The political and economic price would be paid by the Canadian consumer, Canadian export industries and the underdeveloped countries - some of them sterling area countries - from which our present oil imports are drawn.

Saskatoon, August 6, 1959.

ADDENDUM TO SECOND REPORT

by Robert D. Howland

I agree with the recommendations made at the end of Chapter 6 of the Report but I find it necessary to indicate some concern about the general purport of the Chapter. I recognize that any attempt to present in summary and mutually acceptable form the multiple and sometimes conflicting facets of a complex problem is likely to result in degrees of emphasis being placed on some of those facets which are unsatisfactory to any one individual. In my opinion, however, some of the economic factors associated with the presentation of the earlier chapters of the Report might have been more fully analyzed and brought to bear on the discussion in Chapter 6. The seriousness of the omissions may be reduced in this instance by reason of the nature of the general conclusions and recommendations of the Commission.

Nevertheless, Dr. Britnell's observations on the tenor of Chapter 6 and certain points of analysis which he introduces in his Memorandum regarding the issue of the Montreal market seem to me to be pertinent. I concur with his remarks insofar as they reflect a broader analysis of the issues which must be taken into consideration in determining the question of marketing Canadian crude in the Montreal market and to the extent that they tend to emphasize the danger of basing such long-term policy on an analysis of problems which might prove to be short-term in nature.

The conditions facing the oil industry have changed considerably even within the brief existence of this Commission and important variables of the problems which we had under review are peculiarly indeterminate at the present time. For example, it is particularly difficult to assess the prospects of future exports to the United States. It is no less difficult to assess the probable behaviour of international prices of crude oil and petroleum products

and hence to determine the competitive situation which will confront the Canadian oil industry in maintaining and expanding its domestic markets.

Until recently the Canadian oil industry has enjoyed a period of rapid expansion. There is therefore little experience on which to judge its ability to accommodate itself to significant changes in economic circumstances. In view of this and of the uncertainties mentioned above, one is hardly warranted at this time in taking either an optimistic or pessimistic view of the industry's prospects. These considerations appear to me to reinforce the Commission's conclusion that there is a need for a continuing objective study of the situation. Only through such a process will it be possible to determine the wisdom or otherwise of Government action to ensure the marketing of Canadian crude in the Montreal market.

Ottawa, August 12th, 1959.



ADDENDUM TO SECOND REPORT

by R.M. Hardy

I am in agreement with the analysis, conclusions and recommendations set forth in the Second Report of the Commission, but I feel there are certain aspects of the overall situation in the Canadian petroleum industry that require greater emphasis than has been given to them in the Report. These, in my judgment, are of particular importance in forming an opinion as to the extent to which the Government of Canada should properly concern itself with the operations of the industry.

Evidence placed before the Commission made it quite clear that the economics of the international petroleum industry is extremely involved. This appears particularly to be the case in connection with the marketing of oil, and is due partly to the very fact that operations of the major companies are on a world wide scale. In addition, in practically all of the major oil producing areas of the world, the national government exerts an unusually high degree of influence and control over the industry as compared to what is commonly encountered in other international industries. As a result, international trade in crude oil and petroleum products is far from being a simple matter of availability of supply and competition of price.

The Second Report of the Commission draws attention to the fact that circumstances have existed in recent months where Canadian crude has been unable to take over a foreign market area even though, on the basis of posted prices and availability of supply, it had an apparent economic advantage over any alternative source of oil. The fact is that the economic principles governing the operations of the international petroleum industry may work to the advantage of a particular producing area in competition with other sources of supply which would appear to have a price advantage. There is evidence that the Canadian petroleum industry has benefited from this situation in certain market areas in Canada at the same time that it functioned to

its disadvantage in other markets. In addition to these corporate considerations, there are, of course, possible actions by foreign governments that may directly influence the availability of markets for Canadian oil.

The crucial factor, however, is that in such situations decisions may be made which adversely affect the well being of the Canadian petroleum industry and the Canadian national economy in general, and the facts of the matter are, that at the present time, the pertinent decisions may be made without reference to the best national interests of Canada. Surely, in these circumstances, it is a proper function of government to intervene to insure that, to the maximum extent possible, the national interests of Canada are protected.

I wish therefore to emphasize, that if the recommendations of the Commission concerning a national policy for the marketing of Canadian oil are to be effective, the Government of Canada must come forward with a strong, clearly defined policy. Moreover the responsibility and procedures for implementing it must be clearly set out. To do otherwise will merely perpetuate the present situation in which the national interest in petroleum matters is left to the mercy of considerations which may be irrelevant to the best interests of the Canadian economy.

On the highly controversial question of the Montreal market, I am in complete agreement with the conclusions of the Second Report of the Commission that no Government action should be taken at this time to ensure the construction of pipe line facilities to transport Canadian crude oil to the Montreal refinery area, and that before any such action is taken an opportunity be given to the oil industry to develop elsewhere markets sufficient to sustain a healthy and vigorous Canadian oil industry; but that the National Energy Board keep this situation under review. I also am in agreement with the suggestion of the Commission that the next 12 to 18 months should suffice to prove

whether or not Canadian oil can gain access to its naturally economical markets in the United States in adequate volume. Further, I consider that the proposed target level of production for the Canadian Petroleum industry of approximately 700,000 barrels per day by the end of 1960 is a realistic figure. However, it is also my opinion that if this level of production is to be achieved it will require strong support from the Government of Canada in the form of a firm and positive statement of the National policy.

I do not hold the view that the Montreal market is an economically impractical substitute for markets in the middle west and western areas of the United States, and that it therefore should be relegated to the distant future as a means of contributing to the solution of the problem of marketing Canadian crude oil. The data submitted to the Commission on the cost of transporting Canadian crude oil to Montreal, in my judgment, indicate that it is a very real and practical alternative to markets in the United States if these cannot be effectively penetrated. Moreover, I do not hold the view that the implementation of a national policy to assist in the marketing of Canadian crude oil will inevitably involve complete government control of the petroleum industry in Canada. The international petroleum industry traditionally is strongly dedicated to the private enterprise system. Evidence submitted to the Commission made it clear that without question the Canadian industry would conform to a stated national policy to the best of its ability. There is, then, every reason to believe that the industry would fully co-operate in the implementation of a strong national policy based on the best interests of the Canadian economy.

Edmonton. August 14, 1959.

THE ORDERS IN COUNCIL

P. C. 1957-1386

Certified to be a true copy of a Minute of a Meeting of the Committee of the Privy Council, approved by His Excellency the Governor General on the 15th October, 1957.

The Committee of the Privy Council have had before them a report from the Right Honourable John George Diefenbaker, the Prime Minister, representing:

That, in as much as Canada has within its boundaries large sources of energy in the form of gas, oil, coal, water and uranium, the increasing need of energy for the growing industrial requirements of Canada renders it of the greatest importance to assure the most effective use of those resources in the public interest;

That it is desirable that an investigation be made now into a number of questions relating to sources of energy in order to assist in determining the principles and procedures to be applied in the administration of certain aspects of energy policy which fall within the jurisdiction of the Parliament of Canada; and

That it is desirable that a suitable form of organization be devised to ensure that present and future Canadian requirements for energy are taken fully and systematically into account in granting licences for the export of energy or sources of energy.

The Committee, therefore, on the recommendation of the Prime Minister advise that:

Henry Borden, Esquire, C.M.G., Q.C., of the City of Toronto,  
J. Louis Levesque, Esquire, of the City of Montreal,  
George Edwin Britnell, Esquire, of the City of Saskatoon,  
Gordon G. Cushing, Esquire, of the City of Ottawa,\*  
Robert D. Howland, Esquire, of the City of Halifax, and  
Leon J. Ladner, Esquire, Q.C., of the City of Vancouver

be appointed Commissioners under Part I of the Inquiries Act, to enquire into and make recommendations concerning:

- (a) the policies which will best serve the national interest in relation to the export of energy and sources of energy from Canada;
- (b) the problems involved in, and the policies which ought to be applied to, the regulation of the transmission of oil and natural gas between





provinces or from Canada to another country, including, but without limiting the generality of the foregoing, the regulation of prices of rates to be charged or paid, the financial structure and control of pipeline corporations in relation to the setting of proper prices or charges, and all such other matters as it is necessary to enquire into and report upon, in order to ensure the efficient and economical operation of pipelines in the national interest;

- (c) the extent of authority that might best be conferred on a National Energy Board to administer, subject to the control and authority of parliament, such aspects of energy policy coming within the jurisdiction of Parliament as it may be desirable to entrust to such a Board, together with the character of administration and procedure that might best be established for such a Board;
- (d) whether, in view of its special relationship to the Northern Ontario Pipeline Crown Corporation and the nature of its financing and control, any special measures need be taken in relation to Trans-Canada Pipe Lines, Limited in order to safeguard the interest of Canadian producers or consumers of gas; and
- (e) such other related matters as the Commissioners consider it necessary to include in reporting upon those specified above.

The Committee further advise:

1. That the establishment of the Commission and the conduct of its enquiry shall not in any way delay or postpone the continuation of negotiations or of consideration, whether within the International Joint Commission or otherwise, relating to waters crossing the international boundary and the development of electric energy therefrom in the best interests of Canada, or any other matter coming within the jurisdiction of the International Joint Commission, but the Commissioners may comment or report upon any aspects of these matters and of policy relating thereto that they consider to be relevant to the questions referred to them;

2. That the Commissioners be authorized to exercise all the powers conferred upon them by section 11 of the Inquiries Act and be assisted to the fullest extent by government departments and agencies;

3. That the Commissioners adopt such procedure and methods as they may from time to time deem expedient for the proper conduct of the enquiry and sit at such times and at such places in Canada as they may decide from time to time;

4. That the Commissioners be authorized to engage the services of such counsel, staff and technical advisers as they may require at rates or remuneration and reimbursement to be approved by the Treasury Board;



Council; and 5. That the Commissioners report to the Governor in

mission. 6. That Mr. Henry Borden be Chairman of the Com-

(Sgd) R. B. Bryce  
Clerk of the Privy Council.

P. C. 1958-58

Certified to be a true copy of a Minute of a Meeting  
of the Committee of the Privy Council, approved by  
his Excellency the Governor General on the 13th  
January, 1958.

The Committee of the Privy Council, on the recommendation  
of the Right Honourable John George Diefenbaker, the Prime Minister,  
advise that Dr. R. M. Hardy, Dean of the Faculty of Engineering of the  
University of Alberta, be appointed a member of the Commission appointed  
under the Inquiries Act, pursuant to Order in Council P.C. 1957-1386 of  
15th October, 1957 (Energy Policies).

(Sgd) R. B. Bryce  
Clerk of the Privy Council.

P. C. 1957-1473

Certified to be a true copy of a Minute of a Meeting  
of the Committee of the Privy Council, approved by  
His Excellency the Governor General on the 13th  
November 1957.

The Committee of the Privy Council, on the recommendation  
of the Right Honourable John George Diefenbaker, the Prime Minister,  
advise that Joseph Frederick Parkinson, Economic Adviser, Department  
of Finance be appointed Secretary of the Royal Commission constituted  
by Order in Council P.C. 1957-1386 of 15th October, 1957 (Energy  
Policies).

(Sgd) R. B. Bryce  
Clerk of the Privy Council.

P. C. 1957-1574

Certified to be a true copy of a Minute of a Meeting  
of the Committee of the Privy Council, approved by  
His Excellency the Governor General on the 22nd  
November, 1957.

The Committee of the Privy Council, on the recommendation  
of the Right Honourable John George Diefenbaker, the Prime Minister,  
advise that Major N. Lafrance, of Ottawa, be appointed Assistant  
Secretary of the Royal Commission constituted by Order in Council  
P.C. 1957-1386 of 15th October, 1957 (Energy Policies),

(Sgd) A. M. Hill  
Asst. Clerk of the Privy Council,





COMMISSIONERS

Henry Borden, C. M. G., Q.C., Chairman

J. Louis Levesque

George Edwin Britnell

Robert D. Howland

Leon J. Ladner, Q.C.

R. Macdonald Hardy

COMMISSION STAFF

Secretary

J. F. Parkinson

Assistant Secretary

N. A. Lafrance

COUNSEL

General Counsel

A. S. Pattillo, Q.C., Toronto

Assistant Counsel

M. H. Patterson, Calgary

ADVISERS

R. L. Hearn, D. Eng., P. Eng., Toronto

R. Bruce West, Vice-President, A. E. Ames & Co., Limited, Toronto

J. C. Sproule & Associates, Calgary

ASSISTANTS

Ralph B. Toombs, of the Department of Mines and Technical Surveys,  
Ottawa

G. W. Green, of the Department of Trade and Commerce, Ottawa,

M. F. Bélanger, of the Department of Finance, Ottawa.



## HEARINGS

Public hearings were held in the following cities:

Calgary .....	February 3-28, 1958 April 29 to May 16, 1958
Regina .....	April 14-17, 1958
Victoria .....	April 21-24, 1958
Winnipeg .....	May 21-22, 1958
Toronto .....	July 2-10, 1958
Montreal .....	July 14-22, 1958





SUBMISSIONS

Submissions received at public hearings

Department of Mines and Minerals, Province of Alberta

Mr. Floyd K. Beach

Oil and Gas Conservation Board, Province of Alberta

The City of Calgary

Canadian Western Natural Gas Company Limited and  
Northwestern Utilities Limited

Canadian Petroleum Association

Westcoast Transmission Company Limited

Pacific Northwest Pipeline Corporation and  
El Paso Natural Gas Company

Jefferson Lake Sulphur Company

Alberta and Southern Gas Co. Ltd.

Trans-Canada Pipe Lines Limited

The City of Edmonton

The Alberta Gas Trunk Line Company Limited

The British American Oil Company Limited

Northern Natural Gas Company

Amurex Oil Co., Bailey Selburn Oil & Gas Ltd., Banff Oil Ltd.,  
Canadian Export Gas Ltd., Canadian Husky Oil Ltd., Canadian  
Superior Oil of California, Ltd., Dome Exploration (Western)  
Limited, Great Plains Development Company of Canada Ltd.,  
Medallion Petroleums Limited

Canadian-Montana Pipe Line Company

The Government of the Province of Saskatchewan

Woodley Canadian Oil Company

The Coal Operators Association of Western Canada and  
The Western Coal Utilization Council

Producers Pipelines Ltd., and  
Westspur Pipe Line Company

Consolidated Mining & Smelting Co. of Canada, Ltd.

British Columbia Electric Company Limited



Trans Mountain Oil Pipe Line Company

The City of Prince George and  
Prince George Gas Co. Ltd.

Act Oils Limited

Hon. E.C. Manning, Premier, The Government  
of the Province of Alberta

Canadian Devonian Petroleums Limited, Canadian Homestead Oils  
Limited, Canpet Exploration Ltd., Colorado Oil & Gas Ltd.,  
Consolidated East Crest Oil Company Limited, Consolidated Mic  
Mac Oils Ltd., Home Oil Company Limited, Medallion Petroleums  
Limited, Merrill Petroleums Limited, Okalta Oils, Limited,  
Westburne Oil Company Ltd., Western Decalta Petroleum Limited

Interprovincial Pipe Line Company

Shell Oil Company of Canada Limited

Imperial Oil Limited

McColl-Frontenac Oil Company Limited

Triad Oil Co. Ltd.

Canadian Oil Companies, Limited

Mr. W.J. Levy and Mr. M. Lipton

Crow's Nest Pass Towns Committee

The Research Council of Alberta

Royalite Oil Company Limited

West Maygill Gas & Oil Limited

Texaco Exploration Company

Mobil Oil of Canada Ltd., and  
Pan American Petroleum Corporation

The California Standard Company

The Government of the Province of Manitoba

Trans-Prairie Pipelines Ltd.

Saskatchewan Coal Operators

Hudson Bay Mining and Smelting Co., Limited

The Great Plains Gas Company Limited

Stone & Webster Canada Limited





Hon. Leslie M. Frost, Prime Minister, The Government of the  
Province of Ontario

Ontario Fuel Board

The Consumers' Gas Company

Independent Pipeline Company

Mr. Gilbert Jackson

Cities Service Oil Company Limited

Mr. Cyril T. Young

BP Canada Limited

Canadian Bechtel Limited

National Coal Association, Washington, D.C.

Canadian Commercial Coal Dock Operators Association

Sun Oil Company Limited

Canadian Petrofina Limited

Irving Oil Company Limited

Canadian Husky Oil Ltd.

Montreal Pipe Line Company Limited

United Electrical Radio and Machine Workers of America, (UE) -  
Canadian Section

Union Gas Company of Canada Limited

Department of Mines, Province of Nova Scotia

Mid-Continent Pipelines Limited

Canadian Devonian Petroleums Limited, Canadian Homestead Oils  
Limited, Consolidated East Crest Oil Company Limited, Consolidated  
Mic Mac Oils Ltd., Home Oil Company Limited, Merrill Petroleums  
Limited, Okalta Oils, Limited, Westburne Oil Company Ltd.,  
Western Decalta Petroleum Limited

The Quebec Gasoline Retailers and Garage Operators'  
Association Inc.



Other submissions received

Calgary Power Ltd.

Town of Peace River, Town of High Prairie, Town of McLennan,  
Town of Falher, Village of Girouxville, Village of Donnelly

Professor Eric J. Hanson

Northland Utilities Limited

Lloydminster Petroleum Association

Hon. Hugh John Flemming, Premier of New Brunswick

Fisheries Association of B.C.

The Board of Trade of the City of Toronto

Lambton Gas Storage Association

The Canadian Manufacturers' Association

Oil Heating Association

The Canadian Chamber of Commerce

The Government of Saskatchewan

Liquifuels Limited

The Government of British Columbia

Weaver Coal Company

Quebec Natural Gas Corporation

Trans-Northern Pipe Line Company

Niagara Mohawk Power Corporation and  
New York State Natural Gas Corporation

Civic Action League





APPENDIX E

AN HISTORICAL SERIES OF  
CANADIAN PETROLEUM STATISTICS



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TABLE A

## ESTIMATED PROVED REMAINING RESERVES OF LIQUID HYDROCARBONS IN CANADA -- AT YEAR END

1951-1958

(In 35 Imperial gallon barrels which are equivalent to 42 U.S. gallon barrels)  
(thousands of barrels)

	1951	1952	1953	1954	1955	1956	1957	1958
<b>CRUDE OIL</b>								
Northwest Territories	27,100	26,767	26,442	26,172	53,707	53,258	52,858	52,409
Alberta and								
British Columbia	1,328,000	1,526,389	1,624,496	1,928,479	2,169,985	2,391,778	2,363,026 <sup>(1)</sup>	2,581,568
Saskatchewan	21,000	124,247	182,159	222,365	236,872	358,693	420,457	497,372
Manitoba	500	2,106	10,890	29,127	45,211	42,002	34,258	27,500
Total Western Canada	1,376,600	1,679,509	1,843,987	2,206,143	2,505,775	2,845,734	2,870,599	3,158,849
Ontario and New Brunswick	-	-	1,435	1,471	3,759	3,636	3,855	7,055
<b>TOTAL CRUDE OIL</b>	1,376,600	1,679,509	1,845,422	2,207,614	2,509,534	2,849,370	2,874,454	3,165,904
<b>NATURAL GAS LIQUIDS</b>	11,348	65,374	198,126	208,331	247,085	279,934	394,660	484,193
<b>TOTAL LIQUID HYDROCARBONS IN CANADA</b>	1,387,948	1,744,883	2,043,548	2,415,945	2,756,619	3,129,304	3,269,114	3,650,097

(1) These reserves do not reflect any increases that might be attributed to the liquid injection scheme in the Pembina field.

Source: Canadian Petroleum Association.





TABLE B

## CANADIAN PRODUCTION OF CRUDE PETROLEUM, BY PROVINCES,

1930-1958

Year	New Brunswick		Ontario		Manitoba		Saskatchewan	
	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$
1930	6.8	17.4	117.3	235.7	-	-	-	-
1935	13.0	18.2	165.0	346.2	-	-	-	-
1940	22.2	31.2	187.6	397.1	-	-	-	-
1945	30.1	42.4	113.3	268.5	-	-	14.4	15.4
1950	17.1	24.0	250.7	892.0	-	-	1,041.1	1,134.8
1951	15.6	21.8	197.2	677.9	10.7	26.5	1,249.3	1,659.0
1952	14.2	19.9	191.8	641.0	104.8	229.3	1,696.5	2,256.4
1953	14.7	20.6	299.7	994.8	653.5	1,714.8	2,797.9	3,833.1
1954	13.0	18.3	412.5	1,391.7	2,148.2	5,619.6	5,422.9	8,183.3
1955	12.5	17.6	525.5	1,599.3	4,145.8	9,618.2	11,317.2	18,318.0
1956	16.6	23.3	593.4	1,958.1	5,786.5	13,633.1	21,077.4	36,253.1
1957	19.4	27.2	623.7	2,160.0	6,089.7	15,467.9	36,861.1	79,325.1
1958 (1)	15.4	21.6	770.9	2,606.0	5,900.0	14,475.6	46,500.0	100,905.0

	Alberta		British Columbia		Northwest Territories		Total Canada	
	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$
1930	1,398.2	4,780.7	-	-	-	-	1,522.3	5,033.8
1935	1,263.5	3,102.2	-	-	5.1	25.6	1,446.6	3,492.2
1940	8,362.2	10,694.4	-	-	18.6	37.3	8,590.6	11,160.0
1945	7,979.8	13,169.7	-	-	345.2	136.3	8,482.8	13,632.3
1950	27,548.2	82,216.5	-	-	186.7	352.7	29,043.8	84,620.0
1951	45,915.4	113,870.2	-	-	227.4	399.9	47,615.6	116,655.3
1952	58,915.7	139,512.4	-	-	314.2	379.2	61,237.2	143,038.2
1953	76,816.4	193,761.6	-	-	316.7	257.3	80,898.9	200,582.2
1954	87,713.9	228,319.2	-	-	369.9	345.0	96,080.4	243,877.1
1955	113,035.0	274,901.2	-	-	404.2	1,185.8	129,440.2	305,640.1
1956	143,909.6	353,629.2	148.5	302.4	449.4	762.8	171,981.4	406,562.0
1957	137,492.3	355,555.1	340.9	763.7	420.8	294.6	181,847.9	453,593.6
1958 (1)	112,300.0	281,536.1	519.0	1,008.0	471.0	475.0	166,476.3	401,027.3

(1) Preliminary estimate.

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.



TABLE C

WESTERN CANADARESERVES AND PRODUCTION OF CRUDE OIL1950-1958

(in thousands of barrels)

Year	Proved Remaining Reserves as at December 31st	Production	Life Index Years	Percentage (1) Withdrawal
1950	1,202,600	28,378	42.4	2.36
1951	1,376,600	47,402	29.0	3.44
1952	1,679,509	61,037	27.5	3.63
1953	1,843,987	80,580	22.9	4.37
1954	2,206,143	95,578	23.1	4.33
1955	2,505,775	128,903	19.4	5.14
1956	2,845,734	171,372	16.6	6.02
1957	2,870,599	181,171	15.8	6.31
1958	3,158,849	164,740	19.1	5.21

(1) The percentage withdrawal relates the annual production to remaining reserves at the end of the year.

Source: Canadian Petroleum Association.





ALBERTA

TRENDS IN THE GROWTH OF POTENTIAL PRODUCTION

ACTUAL PRODUCTION AND RECOVERABLE RESERVES OF OIL AND CONDENSATE

Year	Recoverable Virgin Reserves (MM Bbls.)	Remaining Recoverable Reserves (MM Bbls.)	Annual Production (MM Bbls)	Cumulative Production (MM Bbls.)	Potential Production (MD/D)	Actual Production (MD/D)	Per Cent Annual Production of Remaining Rec. Reserves	Per Cent Production of Potential
1946	157	72	7	85	18	18	9.72	100
1947	271	180	6	91	18	18	3.33	100
1948	613	512	10	101	29	29	1.95	100
1949	1,046	925	20	121	79	54	2.16	68
1950	1,248	1,100	27	148	146	74	2.45	51
1951	1,520	1,326	46	194	203	126	3.47	62
1952	1,810	1,557	59	253	264	161	3.79	61
1953	2,245	1,915	77	330	317	211	4.02	67
1954	2,605	2,187	88	418	343	240	4.02	70
1955	3,034	2,503	113	531	492	310	4.51	63
1956	3,641	2,966	144	675	684	393	4.86	57
1957	3,926	3,114	137	812	756	376	4.40	50
1958	3,947 <sup>(1)</sup>	3,022 <sup>(1)</sup>	113	925	793	311	3.74	39

(1) Includes Estimated Condensate Reserves.

Source: Alberta Oil and Gas Conservation Board.

TABLE D



TABLE E  
SUMMARY OF WELLS DRILLED IN WESTERN CANADA

1953-1958

	British Columbia	Alberta	Sask- atchewan	Manitoba	Northwest Territories	Western Canada
1953						
Oil	-	811	340	67	-	1,218
Gas	20	159	22	-	-	201
Dry	<u>19</u>	<u>455</u>	<u>315</u>	<u>25</u>	<u>6</u>	<u>820</u>
Total	39	1,425	677	92	6	2,239(1)
1954						
Oil	-	683	391	206	-	1,280
Gas	15	134	24	-	-	173
Dry	<u>12</u>	<u>376</u>	<u>344</u>	<u>103</u>	<u>6</u>	<u>841</u>
Total	27	1,193	759	309	6	2,294
1955						
Oil	1	1,137	549	270	-	1,957
Gas	12	135	20	-	1	168
Dry	<u>23</u>	<u>348</u>	<u>343</u>	<u>91</u>	<u>5</u>	<u>810</u>
Total	36	1,620	912	361	6	2,935
1956						
Oil	7	1,347	784	191	4	2,333
Gas	34	134	12	-	-	180
Dry	<u>16</u>	<u>375</u>	<u>312</u>	<u>63</u>	<u>3</u>	<u>769</u>
Total	57	1,856	1,108	254	7	3,282
1957						
Oil	8	874	853	117	-	1,852
Gas	43	135	16	-	-	194
Dry	<u>43</u>	<u>441</u>	<u>358</u>	<u>108</u>	<u>4</u>	<u>954</u>
Total	94	1,450	1,227	225	4	3,000
1958						
Oil	11	870	498	61	-	1,440
Gas	15	168	17	-	-	200
Dry	<u>49</u>	<u>512</u>	<u>275</u>	<u>31</u>	<u>9</u>	<u>876</u>
Total	75	1,550	790	92	9	2,516

(1) Wells drilled increased steadily from a total of 300 in 1947.

Source: Canadian Petroleum Association, Statistical Yearbook, 1958.





TABLE F

EXPLORATORY AND DEVELOPMENT FOOTAGE DRILLED IN WESTERN CANADA1947-1958

Year	Exploratory Drilling (Feet)	Development Drilling (Feet)	Total (Feet)
1947	*	*	1,089,112
1948	*	*	1,814,560
1949	*	*	3,344,885
1950	*	*	4,602,263
1951	*	*	6,038,342
1952	3,556,723	5,156,110	8,712,833
1953	3,796,741	5,343,211	9,139,952
1954	3,991,813	5,167,489	9,159,302
1955	3,978,114	8,737,680	12,715,794
1956	4,405,607	11,056,911	15,462,518
1957	4,974,340	9,034,403	14,008,743
1958	4,183,228	8,211,301	12,394,529

\* Breakdown not available.

Sources: Provincial Governments and the Canadian Petroleum Association.



TABLE G

PROVINCIAL GOVERNMENT REVENUESFROM LAND SALES, RENTALS AND PRODUCTION ROYALTIES1947-1958

Year	Alberta	Saskatchewan(1)	Manitoba
	\$	\$	\$
1947	1,329,740	-	-
1948	6,539,988	-	-
1949	28,057,273	-	-
1950	49,697,330	45,246	-
1951	39,485,267	197,196	-
1952	53,206,475	657,083	14,449
1953	60,182,708	1,857,830	56,507
1954	108,920,509	4,939,426	268,859
1955	108,956,114	4,480,393	885,532
1956	133,052,550	7,859,805	983,079
1957	134,359,861	18,097,156	906,951
1958	105,440,360(2)	21,329,956(2)	(3)

(1) Fiscal Year ending March 31

(2) Preliminary estimate

(3) Not yet available.

Source: Provincial Governments.





TABLE H

CAPITAL INVESTMENT IN THE CANADIAN PETROLEUM AND NATURAL GAS INDUSTRY 1947-1959

(millions of dollars)

Year	Explora- tion	Extrac- tion	Trans- portation	Pro- cessing	<u>Marketing</u>		<u>Capital Investment in Canada</u>	
					Oil	Gas	Natural Gas Industry	All Industries
1947		9.5	2.6	25.7	14.9	2.5	55.2	2,419.0
1948		37.3	4.3	32.6	9.7	3.8	87.7	3,151.0
1949		45.0	7.7	21.6	11.3	4.3	89.9	3,491.0
1950		53.9	55.0	24.1	16.7	6.6	156.3	3,815.0
1951		72.1	10.7	50.9	18.1	6.8	158.6	4,577.0
1952	59.8	101.6	97.6	61.8	25.0	6.3	352.1	5,285.0
1953	59.1	107.2	79.5	66.8	36.7	11.2	360.5	5,841.0
1954	55.1	126.8	65.1	92.4	46.3	9.7	395.4	5,620.0
1955	67.4	201.6	46.0	105.8	56.5	9.4	486.7	6,350.0
1956	73.7	252.4	177.1	89.6	68.5	46.6	707.9	8,024.0
1957	77.3	237.8	310.1	116.0	74.9	69.8	885.9	8,717.0
1958 <sup>P</sup>	63.7	199.7	235.6	142.9	68.2	88.9	799.0	8,417.0
1959 <sup>F</sup>	59.7	216.8	50.0	132.3	92.5	75.4	626.7	8,321.0
Total	515.8	1,661.7	1,141.3	962.5	539.3	341.3	5,161.9	74,028.0
Per- centage	10.0	32.2	22.1	18.6	10.5	6.6	100.0	

P - Preliminary  
F - Forecast

Notes: Figures shown are capital expenditures on construction and on machinery and equipment. Prior to 1952 capital expenditures in the exploration category were included in the extraction sector. The amounts shown in the marketing category for oil are those expenditures made principally for oil company outlets whereas the gas expenditures relate to natural gas distribution.

Source: Dominion Bureau of Statistics,  
General Assignments Division.



TABLE I

ESTIMATED EXPENDITURES OF THE PETROLEUM

AND NATURAL GAS INDUSTRY IN WESTERN CANADA<sup>(1)</sup>

FOR THE PERIOD 1951-1957

(thousands of dollars)

	ALBERTA	BRITISH COLUMBIA	SASKAT- CHEWAN	MANITOBA	TOTAL
<u>ACQUISITION COSTS</u>					
Land Acquisition & Rentals	487,300	24,100	119,800	25,200	656,400
Geological & Geophysical	377,700	32,800	53,300	6,700	470,500
Exploration Drilling	380,400	33,900	80,800	15,200	510,300
	1,245,400	90,800	253,900	47,100	1,637,200
<u>DEVELOPMENT COSTS</u>	666,300	6,900	169,800	36,400	879,400
OPERATION OF WELLS	250,900	200	30,800	7,200	289,100
TOTAL	2,162,600	97,900	454,500	90,700	2,805,700

(1) Estimated, using as sources the expenditures published by the Provincial Governments of Alberta, Saskatchewan and British Columbia. The estimate for Manitoba has been computed on the basis of wells drilled, geophysical activity and a land survey. Well operation costs for other provinces are estimated to be the same per barrel as Alberta. Expenditures in the Northwest Territories and the Yukon Territory are not included. The estimates shown do not take account of expenditures on pipe lines and natural gas plants.

Source: Canadian Petroleum Association.





## INVESTMENT IN THE PETROLEUM PRODUCING INDUSTRY IN RELATION TO PRIVATE AND PUBLIC INVESTMENT IN CANADA

1943-1959

(in millions of dollars)

Year	Primary Industries (1)		Manufacturing Industries	Utilities	Trade, Finance and Commercial Services	Housing	Institutional Services and Government Departments	Total
	Total	Crude Petroleum and Natural Gas Industry (2)						
1948	529	37	579	551	281	682	529	3,151
1949	622	45	536	678	294	768	593	3,491
1950	697	54	502	720	397	845	654	3,815
1951	820	72	793	900	412	821	831	4,577
1952	878	161	973	1,159	344	826	1,105	5,285
1953	928	166	969	1,209	526	1,084	1,125	5,841
1954	809	182	822	1,124	582	1,178	1,105	5,620
1955	999	269	947	1,099	561	1,499	1,245	6,350
1956	1,306	326	1,394	1,724	611	1,575	1,414	8,024
1957 (3)	1,246	315	1,479	2,308	690	1,430	1,564	8,717
1958 (3)	997	263	1,082	2,135	693	1,781	1,729	8,417
1959 (4)	1,001	277	1,043	1,844	799	1,728	1,906	8,321
Cumulative								
Total	10,832	2,167	11,119	15,451	6,190	14,217	13,800	71,609

(1) Primary Industries include Agriculture, Fishing, Forestry, Mining, Quarrying, Petroleum and Natural Gas and the Construction Industry

(2) Exploration and extraction only; does not include investment in transportation, processing or marketing

(3) 1958 Preliminary

(4) 1959 Intentions.

Source: Compiled by Commission staff from Department of Trade and Commerce data.



THE OIL INDUSTRY AND THE PRAIRIE ECONOMY:

SOME MEASURES OF GROWTH IN ALBERTA, SASKATCHEWAN, MANITOBA AND CANADA

SELECTED YEARS 1946, 1953 AND 1957

TABLE K

	Alberta			Saskatchewan			Manitoba			Canada (a)		
	1946	1953	1957	1946	1953	1957	1946	1953	1957	1946	1953	1957
Population (Mid-year thousands)	803	1,012	1,160	833	861	879	727	809	860	11,962	14,462	16,163
Industrial Employment (1949=100)	83	129	152	92	116	125	90	107	111	88	113	123
Personal Income (\$ millions)	666	1,278	1,641	602	1,112	1,007	579	920	1,123	9,761	17,880	22,692
Value of Mineral Production (\$ millions) (b)	60	249	410	24	48	173	16	25	63	503	1,302	2,108
Value of Crude Petroleum and Natural Gas (\$ millions)	22	200	371	-	4	80	-	2	15	27	211	475
Gross Value of Manufacturing Production (\$ millions)	257	556	762	168	267	303	352	585	673	8,036	17,678	21,981

Notes: (a) Statistics on Newfoundland are not available for the year 1946; therefore in order to provide a consistent series this province has not been included in Canada totals.  
(b) Includes Crude Petroleum and Natural Gas.

Source: Compiled by Commission staff from Dominion Bureau of Statistics data.





## CRUDE OIL REFINING CAPACITY IN CANADA

BY PROVINCES 1940-1958

(in barrels per day)

Year	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories	Total Canada
1940	32,500	250	64,500	57,500	4,150	16,220	16,850	24,500	800	217,270
1945	34,000	250	59,000	75,450	4,500	18,075	18,100	21,000	840	231,215
1950	22,000	300	143,000	75,200	7,800	33,575	46,900	28,850	1,250	358,875
1951	22,000	300	160,000	79,400	20,500	47,500	61,750	28,850	1,250	421,550
1952	22,000	300	164,000	104,500	19,700	50,300	68,000	28,350	1,250	458,400
1953	18,000	300	176,000	135,000	20,000	58,100	69,150	45,850	1,250	523,650
1954	18,000	300	171,500	142,300	20,000	67,300	68,600	55,500	1,250	544,750
1955	18,000	300	210,000	148,800	29,800	66,300	77,500	66,500	1,250	618,450
1956	42,000	300	247,000	159,700	30,800	69,350	79,350	70,250	1,300	700,050
1957	44,000	300	255,800	198,510	33,220	68,975	85,540	74,250	1,300	761,895
1958	49,000	300	264,800	228,822	33,220	67,875	85,290	96,750	1,300	827,407

Source: Mineral Resources Division - Department of Mines and Technical Surveys



TABLE M  
CRUDE OIL RECEIPTS AT CANADIAN REFINERIES 1940-1958

(in barrels of 35 Imperial gallons)

Year	Canadian Crude	Foreign <sup>(1)</sup> Crude	Total Crude
1940	8,635,309	41,235,956	49,871,265
1945	7,852,318	58,050,996	65,903,314
1950	26,666,376	82,476,476	109,142,852
1951	47,185,925	83,139,573	130,325,498
1952	58,894,631	82,467,322	141,361,953
1953	69,345,587	81,406,110	150,751,697
1954	92,679,819	76,773,031	169,452,850
1955	105,050,563	86,751,128	191,801,691
1956	125,592,074	106,305,532	231,897,606
1957	126,914,237	111,706,671	238,620,908
1958	134,513,998	107,444,741	241,958,738

(1) Crude oil receipts at refineries do not necessarily correspond exactly with crude oil imports, as reported at customs ports of entry, because of inventories held by pipe line companies and the time lag involved in moving oil from ports of entry to refineries.

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.

OWNERSHIP OF REFINERY CAPACITY IN CANADA

1958

Company	No. of Refineries	Crude Oil Capacity (bbl./day)	Percentage of Total Canadian Capacity
Imperial Oil Limited	9	318,650	38.5
The British American Oil Company Ltd.	6	146,250	17.7
Texaco Canada Limited	3	91,000	11.0
Shell Oil Company of Canada Ltd.	2	81,500	9.8
Canadian Petrofina Limited	1	29,000	3.5
Canadian Oil Companies Limited	1	27,400	3.3
Cities Service Company Limited	1	20,000	2.4
Standard Oil Company of British Columbia, Ltd.	1	18,000	2.2
Royalite Oil Company Limited	4	16,625	2.0
Consumers' Co-operative Refineries Limited	1	16,000	1.9
Sun Oil Company Limited	1	15,000	1.8
North Star Oil Limited	2	15,000	1.8
Canadian Husky Oil Ltd.	3	14,562	1.8
All other companies	<u>7</u>	<u>20,420</u>	<u>2.4</u>
	42	827,407	100.0

Source: Mineral Resources Division, Department of  
Mines and Technical Surveys.





TABLE N

EXPORTS OF CRUDE PETROLEUM AND REFINED PETROLEUM PRODUCTS1930-1958

Year	Crude Petroleum		Refined Petroleum Products		Total Crude and Refined Products	
	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$
1930	717	1,281	197	1,250	914	2,531
1935	-	-	468	1,008	468	1,008
1940	-	-	440	2,000	440	2,000
1945	-	-	3,157	14,635	3,157	14,635
1950	-	-	399	2,386	399	2,386
1951	342	807	338	3,129	680	3,936
1952	1,425	3,452	1,206	6,870	2,631	10,322
1953	2,507	6,228	348	1,630	2,855	7,858
1954	2,345	6,318	733	3,573	3,078	9,891
1955	14,834	36,254	1,272	5,640	16,106	41,714
1956	42,908	103,923	2,745	12,258	45,653	116,181
1957	55,674	140,975	3,718	16,331	59,392	157,306
1958	31,679	73,044	967	4,927	32,646	77,971

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.



TABLE O

IMPORTS OF CRUDE PETROLEUM AND REFINED PETROLEUM PRODUCTS

1930-1958

Year	Crude Petroleum(1)		Refined Petroleum (2) Products		Total crude and Products	
	'000 bbl.	\$'000	'000 bbl.	\$'000	'000 bbl.	\$'000
1930	31,724	48,351	4,074	15,158	35,798	63,509
1935	30,254	31,293	3,632	9,379	33,886	40,672
1940	42,623	48,320	6,217	17,624	48,840	65,944
1945	56,807	72,321	5,657	23,208	62,464	75,529
1950	80,124	203,996	27,140	108,950	107,264	312,946
1951	84,237	233,148	30,373	127,353	114,610	360,501
1952	82,751	210,035	33,796	136,764	116,547	346,799
1953	81,628	213,094	35,303	149,810	116,931	362,904
1954	78,884	212,787	35,321	136,246	114,205	349,033
1955	86,792	229,779	37,694	149,122	124,486	378,901
1956	106,641	271,291	37,534	157,522	144,175	428,813
1957	111,905	305,557	34,734	155,975	146,641	461,532
1958	105,859	278,541	30,445	127,072	136,304	405,613

(1) Crude Petroleum includes relatively small quantities of petroleum tops imported for blending purposes.

(2) Refined Petroleum Products converted to barrels of 35 Imperial gallons. For the years 1940 and 1945 imports of L.P.G's were reported as to value only.

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.





TABLE P

BALANCE OF TRADE - CRUDE PETROLEUM  
AND REFINED PETROLEUM PRODUCTS

1930-1958

(thousands of dollars)

	<u>Crude Petroleum</u>			<u>Refined Petroleum Products</u>		
	Imports	Exports	Net Imports	Imports	Exports	Net Imports
1930	48,351	1,281	47,070	15,158	1,250	13,908
1935	31,293	-	31,293	9,379	1,008	8,371
1940	48,320	-	48,320	17,624	2,000	15,624
1945	72,321	-	72,321	23,208	14,635	8,573
1950	203,996	-	203,996	108,950	2,386	106,564
1951	233,148	807	232,341	127,353	3,129	124,224
1952	210,035	3,452	206,583	136,764	6,870	129,894
1953	213,094	6,228	206,866	149,810	1,630	148,180
1954	212,787	6,318	206,469	136,246	3,573	132,673
1955	229,779	36,254	193,525	149,122	5,640	143,482
1956	271,291	103,923	167,368	157,522	12,258	145,264
1957	305,557	140,975	164,582	155,975	16,331	139,644
1958	278,541	73,044	205,497	127,072	4,927	122,145

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.



TABLE Q  
SOURCES OF IMPORTS OF CRUDE PETROLEUM<sup>(1)</sup>  
1950-1958

Year	Venezuela		United States		Middle East	
	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$
1950	28,777	80,374	31,267	90,139	17,872	28,113
1951	45,474	125,634	21,724	59,596	13,636	38,795
1952	50,976	126,581	20,337	54,406	8,272	22,711
1953	56,944	144,785	14,575	40,510	7,609	21,763
1954	60,090	158,230	9,168	28,114	6,695	19,593
1955	66,329	172,883	7,166	22,446	9,863	26,608
1956	77,235	196,560	6,161	18,621	19,122	46,496
1957	88,079	241,629	8,076	25,973	14,382	34,464
1958	72,365	199,910	1,398	4,684	30,097	68,902

Year	Trinidad		All Other Countries		Total Imports	
	'000 bbl	'000 \$	'000 bbl	'000 \$	'000 bbl	'000 \$
1950	2,208	5,370	-	-	80,124	203,996
1951	1,987	4,335	1,416	4,788	84,237	233,148
1952	1,988	4,093	1,178	2,244	82,750	210,035
1953	2,351	5,536	149	500	81,628	213,094
1954	2,931	6,850	-	-	78,884	212,787
1955	2,860	6,704	574	1,138	86,792	229,779
1956	3,096	7,387	1,027	2,227	106,641	271,291
1957	1,368	3,491	-	-	111,905	305,557
1958	1,999	5,045	-	-	105,860	278,541

(1) Includes Petroleum Tops imported for refining purposes.

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.





TABLE R  
SOURCES OF IMPORTS OF REFINED PETROLEUM PRODUCTS

1950-1958

(in thousands of dollars)

Year	United States	Netherlands Antilles	Venezuela	Trinidad	All other Countries	Total
1950	85,340	17,089	5,582	363	576	108,950
1951	106,134	10,655	10,435	86	43	127,353
1952	117,253	11,528	7,895	4	84	136,764
1953	132,680	7,799	7,189	114	2,028	149,810
1954	106,890	20,275	8,544	98	439	136,246
1955	103,944	30,422	13,959	76	721	149,122
1956	107,329	37,947	11,184	3	1,058	157,522
1957	109,945	39,259	5,967	9	795	155,975
1958	78,200	39,450	8,814	217	391	127,072

Source: Compiled by Commission staff from  
Dominion Bureau of Statistics data.



TABLE S  
CANADIAN SUPPLY AND DEMAND OIL BALANCE  
1956-1958  
(quantities in MB/D)

	1956	1957	1958	% Change 1958 over 1957
Domestic Oil Production	470	498	454	-9
Domestic Natural Gasoline & LPG	8	9	10	<del>11</del>
Less: Increase in Inventories and Storage;				
Oil	2	-5	5	-
LPG's	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>Total Domestic Supply</u>	<u>475</u>	<u>512</u>	<u>459</u>	<u>-10</u>
Plus: Imports - Oil	291	306	294	-4
- LPG & Products	103	95	82	-14
- Blends & Other Materials	6	2	2	-
Less: Exports - Oil	119	152	84	-45
- Products	7	9	4	-56
Less: Pipeline Losses and Unaccounted For Supply	<u>12</u>	<u>1</u>	<u>-</u>	<u>-100</u>
<u>Total Available Supply</u>	<u>737</u>	<u>753</u>	<u>749</u>	<u>-1</u>
Increase in Product Inventories	<u>19</u>	<u>11</u>	<u>-16</u>	<u>-245</u> <sup>(1)</sup>
<u>Total Consumer Demand for Oil and Products</u>	<u>718</u>	<u>742</u>	<u>765</u>	<u>-13</u>
% Domestic Oil Production of Total Consumer Demand for Oil	74.6	75.9	68.4	
% Domestic Supply of Total Consumer Demand for Oil and Products	66.2	69.0	60.0	
% Effective <sup>(2)</sup> Domestic Supply of Total Consumer Demand for Oil and Products	45.3	47.2	48.5	
% Net Imports of Total Consumer Demand for Oil and Products	38.2	32.6	37.9	
% Net Product Imports of Total Consumer Demand for Oil and Products	14.2	11.9	10.5	

(1) Increase On Opening Inventories

(2) Domestic Supplies Used In Supplying Canadian Demand

Source: Compiled by Oil and Gas Conservation Board of Alberta  
from Dominion Bureau of Statistics and Provincial Government data.





# SUPPLY AND DEMAND, ALL OILS, 1952 - 1958

(in barrels per year)

	1952	1953	1954	1955	1956	1957	1958**
<b>SUPPLY</b>							
<b>Production</b>							
Crude oil .....	61,237,322	80,898,897	96,080,345	129,440,247	171,981,413	181,848,004	165,520,737
Natural gasoline, etc. <sup>1</sup> .....	579,873	602,368	673,564	868,416	2,595,210	2,980,504	2,809,016
Total Production .....	61,817,195	81,501,265	96,753,909	130,308,663	174,576,623	184,828,508	168,329,753
Production, bbl./day .....	168,899	223,291	265,079	357,010	476,985	506,423	461,177
<b>Imports</b>							
Crude oil <sup>2</sup> .....	81,876,206	80,266,682	78,883,670	86,792,460	106,641,358	111,905,473	107,444,741
Products <sup>3</sup> .....	34,218,692	36,015,666	33,501,082	37,657,197	37,456,653	34,644,099	30,435,271
Total Imports .....	116,094,898	116,282,348	112,384,752	124,449,657	144,098,011	146,549,572	137,880,012
<b>Change in Stocks</b>							
Crude oil .....			+ 104,917	- 2,899,590	- 871,857	+ 699,643	- 949,217
Products <sup>4</sup> .....			- 2,688,573	- 1,380,113	- 7,549,496	- 2,661,024	+ 5,720,516
Total Change in Stocks .....	- 7,199,565	- 9,358,227	- 2,583,656	- 4,279,703	- 8,421,353	- 1,961,381	+ 4,771,299
Total Supply .....	170,712,528	188,425,386	206,555,005	250,478,617	310,253,281	329,416,699	310,981,064
<b>DEMAND</b>							
<b>Exports</b>							
Crude oil .....	1,424,456	2,507,314	2,344,948	14,833,971	42,908,086	55,674,228	31,679,429
Products .....	1,213,344	352,412	484,726	880,932	2,560,313	3,635,832	936,600
Total Exports .....	2,637,800	2,859,726	2,829,674	15,714,903	45,468,399	59,310,060	32,616,029
<b>Domestic Sales</b>							
Motor gasoline .....	62,140,038	67,193,393	70,116,107	75,644,262	83,020,237	87,724,628	92,137,073
Middle Distillate <sup>4</sup> .....	43,507,842	47,818,022	56,414,725	71,434,493	84,577,275	87,645,800	94,155,317
Heavy fuel oil .....	34,225,505	36,700,421	39,840,857	43,193,422	46,476,581	48,596,728	43,247,833
All other products <sup>5</sup> .....	13,665,838	17,799,653	20,327,445	23,920,554	31,317,929	28,701,008	30,186,830
Total Domestic Sales .....	153,539,223	169,511,489	186,699,134	214,192,731	245,392,022	252,668,164	259,727,053
Refinery Uses & Losses .....	11,099,014	14,672,752	12,514,002	14,851,203	16,845,131	17,811,405	18,845,108
Field & Pipe Line Use & Losses .....	- 234,344	516,544	504,060	2,134,160	551,515	1,409,122	- 11,453
Total Plant Use & Losses .....	10,864,670	15,189,296	13,018,062	16,985,363	17,396,646	19,220,527	18,833,655
Fuel Oil, Ex-warehoused, Ships Stores .....	445,679	537,042	235,477	48,788	-	-	-
Total Demand .....	167,487,372	187,560,511	202,782,347	246,941,785	308,257,067	331,198,751	311,176,737
Oils Not Accounted For .....	3,225,156	864,875	3,772,658	3,536,832	1,996,214	1,782,052	195,673
Domestic Demand, All Oils Total .....	164,403,893	184,163,743	199,717,196	231,178,094	262,788,668	271,888,691	278,560,708
Domestic Demand, All Oils bbl./day .....	449,191	504,558	547,170	633,365	718,002	744,901	763,180

\*\* Preliminary.

<sup>1</sup> Includes L.P.G.

<sup>2</sup> Includes small quantities of natural gasoline.

<sup>3</sup> Includes small quantities of petroleum tops.

<sup>4</sup> Includes aviation turbo fuel, kerosene, stove oil, tractor fuel, diesel fuel and light fuel oils (Nos. 2 & 3).

<sup>5</sup> Includes L.P.G., petro-chemical fuel stocks, naphtha specialties, aviation gasoline, asphalt, petroleum coke, lubricating oil and grease, wax, still gas and minor quantities of miscellaneous products.

<sup>6</sup> Includes L.P.G. in storage in Alberta, 1956 - 58.

Source: Mineral Resources Division, Department of Mines and Technical Surveys, Ottawa.

TABLE T



TABLE U

THE RELATIVE IMPORTANCE OF OIL  
AS A SOURCE OF ENERGY IN CANADA

1945-1958

(expressed in percentages)

Year	Coal	Hydro	Gas	Crude Oil			
				Imported	Canadian	Total	
1945	64.3	8.0	3.4	21.4	2.9	24.3	100.0
1950	53.0	7.8	4.1	27.6	7.5	35.1	100.0
1953	40.4	8.7	5.5	26.6	18.8	45.4	100.0
1955	31.6	9.1	7.3	25.2	26.8	52.0	100.0
1956	29.3	8.3	7.6	24.7	30.1	54.8	100.0
1957	25.4	8.4	9.8	24.9	31.5	56.4	100.0
1958	20.0	9.6	16.1	24.3	30.0	54.3	100.0

Source: "Energy Sources in Canada" annual studies by  
C.L. O'Brian and A.W. Lovett,  
Dominion Coal Board.





SOME ALBERTA, UNITED STATES, VENEZUELA AND MIDDLE EAST CRUDE OIL PRICES

1946-1959

(in U.S. dollars per barrel<sup>(1)</sup> at year-end)

YEAR	UNITED STATES				VENEZUELA (2)				MIDDLE EAST (2)	
	CANADA	Illinois Basin	Oklahoma-Kansas 36°-36.9° gravity	California (Long Beach) 27°-27.9° gravity	East Texas 38°-38.9° gravity	Texas Gulf 30°-30.9° gravity	Officina 35°-35.9° gravity	Tia Juana 26°-26.9° gravity	Kuwait 31°-31.9° gravity	Saudi Arabia 34°-34.9° gravity
1945	-	*	1.17	1.15	1.25	1.28	*	*	*	*
1946	-	*	1.37	1.33	1.44	1.47	*	*	*	*
1947	-	*	1.90	1.85	1.98	2.05	*	*	*	*
1948	3.20	*	2.57	2.45	2.65	2.68	*	*	*	*
1949	2.88	2.77	2.57	2.40	2.65	2.68	*	*	*	*
1950	2.73	2.77	2.57	2.37	2.65	2.68	*	*	*	*
1951	2.44	2.77	2.57	2.41	2.65	2.68	2.63	2.30	1.65	1.71
1952	2.32	2.77	2.57	2.41	2.65	2.68	2.63	2.24	1.65	1.71
1953	2.38-2.64	3.02	2.71	2.72	2.79	2.92	2.76	2.25	1.64	1.81
1954	2.55	2.90	2.82	2.76	2.90	3.03	2.88	2.30	1.72	1.93
1955	2.49	3.00	2.82	2.76	2.90	3.03	2.87	2.30	1.72	1.93
1956	2.49	2.90	2.82	2.78	2.90	3.03	2.80	2.30	1.72	1.93
1957	2.63-2.67	3.15	3.07	3.17	3.25	3.48	3.04	2.54	1.80	2.05
1958	2.56	3.00	3.00	3.06	3.25	3.58	3.05	2.55	1.85	2.08
1959 (March)	2.42	3.00	2.97	3.06	3.25	3.58	2.90	2.40	1.67	1.89

\* Prices not available.

(1) This applies to prices of all crudes except Redwater, Alberta prices which are in Canadian dollars.

(2) F.O.B. shipping port. United States and Canadian prices are field prices.

Source: "Monthly Bulletin of Statistics", April 1959, United Nations, New York; United States Bureau of Mines; Oil and Gas Conservation Board of Alberta.

TABLE V



















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